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SURGICAL DIAGNOSIS*

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During the past few years we have been graduating from our hospitals more teachnicians than diagnosticians, and if this is continued, surgery will lose the enviable position won for it by the tireless efforts of a generation.

The leading surgeons in the country today, Horsley, Deaver, the Mayos, Crile and many others, owe their reputations to their diagnostic ability.

The late John B. Murphy, whose reputation as one of our greatest surgeons was not questioned, was entitled to this honor because, first, of his knowledge of surgical diagnosis; second, of surgical pathology; third, as a teacher and, fourth, as an operator. He taught his students that the most valuable and important asset of a surgeon was his ability to make a correct diagnosis.

Today, the American College of Surgeons are insisting, in standardized hospitals, that the records show the pre-operative as well as the operative diagnosis.

Important, as it is, to have an accurate diagnosis, our endeavors to obtain one does not entail injury to the patient, nor involve the loss of the most favorable moment for successful operation while the refinements of diagnosis are being investigated.

As a profession, we are probably less acute in our general observations than was the practitioner of the old school. In his day, everything depended on observation, and apparently no little thing was overlooked, whereas today we are supported by many laboratories of special investigation.

The old saying that more mistakes are made in diagnosis on account of lack of observation than on account of a lack of knowledge, still seems to hold.

There are six common causes of diagnostic mistakes:

1. Incomplete or incorrect case history-taking.
2. Incomplete examination of patient.
3. Ignorance of certain pathologic complexes.
4. Failure to explain the atypical.
5. A plus of laboratory detail and of ultra-modern methods at the expense of sound judgment and good sense.
6. The riding of a hobby.

The basis of a diagnosis is the history and the examination. A careful history, taken properly, letting the patient tell her own story, skillful and sympathetic questioning, exact dates, and little details will ofttimes give us an inkling to the trouble. It should be properly written, properly arranged, events put down in their order and when we have finished we usually have a probable diagnosis. Prominent symptoms should be explained, for example, *pain in abdomen*, where, what kind of pain, dull aching, sharp or shooting, continuous, intermittent, cramp like, etc., etc.

Bleeding from uterus; at menses; is usual amount increasing? Is she flowing between times? Has she missed, has she pains? etc.

All these symptoms should be detailed as they are important in our diagnosis.

A complete examination is the next important step. Here we rely on our old friends, inspection, palpation, percussion and auscultation.

In these days of infection we must begin with the head, inspect the sinuses, teeth, throat, and neck. We must not forget to examine every breast for lumps and we will be surprised how many of these unsuspected tumors are carcinoma.

The abdomen is a most important place for the surgeon. Is the abdomen symmetrical? Are there any elevations or depressions? Is it rigid? Are the muscles drawn tense at any point, as would happen in an acute abdomen? Follow with the penis (oftener a scar will help you later in your final verdict), testicles and rectum. Right here, I wish to say that it seems to me that some doctors do not like to put their fingers into it, yet we all know that our examination is incomplete without it. I have seen sad examples of

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carcinoma that have been treated for months for piles, simply on surmise, no examination having been made. When the abdominal findings are not satisfactory, especially in men, the rectal examination often clears up the diagnosis.

Here I might state also, that the routine testing of the reflexes, more particularly of the knee-jerks, is worthy of insistence.

Palpation is our most valuable asset, and to be able to utilize this to the fullest advantage, demands constant and careful practice.

To be able to see with our finger tips is an art which all of us do not possess and evidently cannot be acquired.

Palpation will detect tenderness, swellings, masses, tumors, rigidity of the abdominal wall, pulsations, movements of gas, fluctuation, etc.

Deaver says that "exquisite tenderness is a more reliable sign of the presence of pus than is a leucocyte count."

Percussion is a valuable adjunct, especially in abdominal diagnosis, presence of fluid, changing position of patient, altering sounds, gas, etc.

Auscultation, when the surgeon can interpret what he hears and can differentiate the abnormal from the normal sounds in the abdomen, is another great asset in our diagnosis.

Increased or decreased peristalsis, absence of peristalsis, tinkling in obstruction is often a serious sign. In fact we have in the abdomen oftimes signs of extra-abdominal diseases as pleurisy, pneumonia, tuberculosis, syphilis, etc., which can be differentiated by careful physical examination. But, with all the above, we would be unwise to depend on these alone when we have the help of the laboratory, but it is by the correlation of the clinical with the laboratory findings that the laboratory is constantly adding to our knowledge.

But we have to be careful in our interpretation of some of these findings. The results of test meals vary so much in what we would expect to find in certain conditions, as not to be reliable. A complete blood count should be made on all surgical patients and we will often be surprised by finding malaria when we least expect it.

The finding of occult blood in the stomach or feces does not mean anything by itself. It should be our practice to examine routinely the functional ability of the kidneys.

Since the advent of insulin we are able, with the aid of the laboratory, by estimating the blood and urinary sugar, to treat these cases with surgery without more danger than if they had none. But we must not forget the X-ray; here we have an accurate method of diagnosing fractures, ulcers, tumors, abscesses, stones, etc., and this is our most valuable adjunct in clinching our diagnosis.

Assuming that we have made our diagnosis, let us open the abdomen, for instance, and see if we are able to make a so-called operative diagnosis. Here is where we need our knowledge of topographical anatomy of the abdominal viscera, morbid anatomy, living pathologic anatomy and surgical physiology.

Are you able to distinguish the abnormal from the normal? Do you know your landmarks?

In taking out an appendix I have seen operators take up much time trying to find it, when if they knew their anatomy, they would recognize the cecum, ilio-cecal and colic folds and find it quickly.

In operations for diseases of the gall-bladder, ducts, pancreas, etc., after good exposure, it takes all our means of examination to make sure of our diagnosis.

The pre-operative diagnosis of ulcer is confirmed by inspection and palpation. How many of us have opened an abdomen with a pre-operative diagnosis of ulcer, including positive X-ray report, and found none, but probably found a diseased gall-bladder or appendix and by removing them cured their stomach trouble.

Another great help in our operative diagnosis is by means of the frozen section; as this is done while we are operating, we are giving our patient the benefit of every doubt, and when this may save them a radical breast amputation, it should be an essential part of our routine.

This paper would be too long and tiresome should I go into the diagnosing of the post-operative abdominal complications. Suffice to say that these conditions can be pretty accurately determined by careful observation of diagnostic details.

In concluding I wish to repeat what Dr. Strause of Chicago, an internist, once said: "Many acute abdominal conditions present at onset vague symptoms," which is the best reason for deferring "medical treatment" and for watchfully waiting for the change which makes diagnosis possible, and if we accept the dictum that every acute abdominal condition may be a surgical condition, it follows that in all such cases the surgeon should be called in early. While we

believe that the medical man should try to make an anatomical and physiological diagnosis, he should not jeopardize his patient's life by delay in conferring with his surgical colleague during the period of observation.

A good surgeon should have the following qualifications: First, he should be a diagnostician, that is knowing what is the matter with his patient; second, he should possess surgical judgment, that is knowing what to do and when to do it; third, he should have operative ability, knowing how to do it.

DISCUSSION.

Dr. John S. Helms, Tampa:

This is a very large and a very important subject, upon which there have been a great many volumes written, all of which show the extreme importance of it and also its complicity.

Surgical diagnosis is indeed a very important matter from the patient's viewpoint, because oftentimes it saves the patient, when the diagnosis is carefully made, from disaster.

It has been stated that about 80 per cent of all diseases, both medical and surgical, can be diagnosed by the average medical man in possession of the average facilities for making such studies as he is able to make of the case. This leaves about 20 per cent, which require to be studied by men who either specialize or make a special study of the different phases of medical and surgical diseases, or studied by groups of men. And after they have been studied about 15 per cent of correct diagnoses are made, leaving 5 per cent that are practically undiagnosed by all the means that the "teams" or the individual man have been able to bring to bear upon the case.

I am a strong believer in "team" work when it comes to the question of a diagnosis, and this is particularly true in surgical diagnoses. It is very difficult for one man to be able to make application of all the methods that are necessary to make a diagnosis in the obscure case. It is therefore necessary that we bring together and to bear upon the given case a group or a "team," that are able to work out the special phases of the case, in order to arrive at a correct diagnosis.

The treatment of surgical cases, like medical cases, can only be determined upon when one has made a correct diagnosis. I feel that laboratory methods are among our most important methods. We might guess from the history of the case the disease that the patient is suffering from, and our guess in 80 per cent of the cases might be correct. But even so I feel that this ought to be proven for the safety of the patient by all the means that are available to us, and I think the laboratory is one of the most important factors in determining the correct diagnosis and proving a good guess.

Dr. F. J. Waas, Jacksonville:

As Dr. Helms has stated, Dr. McEwan has certainly covered a very large subject, and a very big one.

The thing that impresses me more about the paper is that it brings out the importance of careful history-taking. I think if we will spend more time with our patients, that we will be better able to figure our clinical findings and try to correlate them with our laboratory findings. I believe in that way we will be able to reach a more or less complete pre-operative diagnosis.

One thing that the American College of Surgeons has done is to stress the importance of careful history-taking. In order to get complete history we have to spend more time with our patients, and our patients are being enormously benefited by it. I think this will help us a great deal in getting more efficient surgery.

Also, the X-ray to my mind is quite an important factor in concluding our diagnosis, especially from a gastric standpoint. We may have the same interpretations by other means, but the applied X-ray man has to be taken into consideration in interpreting X-ray findings from a gastric standpoint. I remember in one of my cases we had a positive diagnosis of gastric ulcer, and in exploring we found a chronically diseased gall-bladder and appendix, and negative gastric findings. I think we should have an interpretation of the findings by the Roentgenologist, because we very often do get a pylorospasm which manifests itself from an X-ray standpoint and is very frequently interpreted as pathology and diagnosed, and then complete our findings by calling upon our surgical intuition or surgical judgment in order to give our patients the benefit and privilege of a successful surgical diagnosis.

Dr. E. H. Teeter, Jacksonville:

In surgical diagnosis we certainly must use our surgical judgment. I have known cases after case that I have seen, that we had had laboratory work done on and all kinds of examinations, including X-ray, that were not operated on as it then seemed unnecessary, but after they came to autopsy we found out that they had the disease that was diagnosed in the beginning. On account

of the laboratory findings and the X-ray, etc., they were not operated on. So I want to emphasize that surgeons with surgical judgment must not let the laboratory and the X-ray put them over too much on the over-side.

Dr. John S. McEwan, Orlando (closing):

I think that Dr. Teeter's last remarks coincide with what I have in mind, and also the remarks of Dr. Helms.

I believe in "group practice" for the reason that we cannot keep up in all branches of medicine because they are getting to be exact sciences. Therefore we must have the help of the specialists, and with their opinion we must make up our own diagnosis. Here is where Dr. Teeter comes in. We ought to have enough surgical judgment to decide ourselves whether or not the patient should have an operation, when he should have it, and what he ought to have done.

A PLEA FOR THE EARLY DIAGNOSIS AND TREATMENT OF PULMONARY TUBERCULOSIS*

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The reduction of the death rate from pulmonary tuberculosis in the last decade has been most gratifying and gives promise that in the not distant future this disease, like other formidable enemies of mankind, may fall before the tireless sword of science. The progress so far shown has been due primarily, and one might say entirely, to the early recognition and treatment of this disease. In recognition of these facts this plea is addressed to you.

It is stated by competent authority that pulmonary tuberculosis costs the United States over one billion dollars per year. Professor A. Caswell Ellis, of the University of Texas, states that "Three times as many people in proportion to the population have this disease in America as do in England, Scotland, Sweden, Norway or Switzerland."

Since the discovery of the germ by Koch, and with improved methods of prevention and treatment, it has been shown where this knowledge is applied, 79 per cent of the loss from tuberculosis can be prevented.

Since August, 1919, I have examined 3,700 cases of pulmonary tuberculosis. Of this number only 279 were incipient cases. One is amazed at the great number of these, although they presented definite clinical and physical signs of tuberculosis, they had been treated for dyspepsia, anæmia, chronic bronchitis, neurasthenia, anorexia and other ailments. These errors in diagnosis cause the loss of much valuable time and what is still more important permit the infection of the patient's family and close associates. It has been my experience that the rank and file of the medical profession in my part of the State fail more often than succeed in the diagnosis of incipient tuberculosis. Most of the cases referred to me with a diagnosis of incipient tuberculosis were cases which were acute exacerbations of old quiescent lesions.

The detection of early tuberculosis is not a feat requiring the possession of skill or knowledge greater than that possessed by the average physician, but in order to succeed one must use all the diagnostic agents necessary for the detection of other incipient organic diseases.

In no other disease is a careful history more important. The family history should be carefully scrutinized for evidence of the disease either past or present. This disease is not often conveyed by occasional contact, but rather by repeated and intimate association over weeks, months or years, especially during childhood, which I believe to be the period during which by far the greater number of infections are acquired.

The patient's personal history should include such information as the presence of slight and persistent daily oscilations of temperature above and below normal. The presence of a sub-normal morning temperature is as suggestive of tuberculosis as the afternoon rise. The average, present and maximum weights should be recorded. Evidence of heamoptysis, hæmorrhage, chronic cough, lassitude in the afternoon, nervousness, which was the most common symptom complained of in my cases, pleurisy, night sweats, loss of appetite and dyspeptic symptoms, are very often found even in very early cases.

Any patient who has a cough lasting over six weeks who is not asthmatic and does not have an emphysematous chest, should be considered tubercular until he can be proven otherwise.

The occurrence of true hæmorrhage of obscure cryptogenic origin should be considered of tubercular nature until proof to the contrary is obtained. This is a clinical axiom from which the

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practitioner should never depart, lest he takes upon himself responsibility and meet with grievous disappointment.

Pleurisy, which is not the accompaniment of pneumonia or trauma, is no doubt, in the vast majority of cases, pathognomonic of tuberculosis. Idiopathic pleurisy, in my opinion, does not exist. The physician who fails to properly study repeatedly any case complaining of pain in the chest, increased on deep inspiration, is derelict in his duty to his patient, and often accessory to the infection of the patient's family.

The physical examination should not be of the chest alone, but should include the patient's entire body. It is, however, upon the chest that one should spend most time, for it is here that our physical diagnostic technique will give us most information. The physical examination of the chest to be of value in early tuberculosis must be most carefully and exhaustively made. I have found that next to ausculation, inspection gives the most information, the change in the contour of the chest wall and the movement of the chest during respiration, give evidence very early of changes in the lung and pleura beneath. The affected side shows retraction and respiratory lag very early in this disease. The deepening of the supra-clavicular fossa, together with a noticeable wasting of the shoulder girdle muscles of the diseased side, is observed in many incipient cases.

Palpation sometimes gives information in this stage of the disease. Although the tactile fremitus should be tested over the entire chest, it quite often fails to give definite signs of changes in the adjacent lung.

Percussion I believe to be a diagnostic procedure which requires much training and precision in order to detect slight changes in lung density. The accurate outlining of the apiceal isthmus above the clavicle and the determination of the posterior excursion of the bases of the right and left lung, during deep inspiration, is information of much weight in making the diagnosis. No chest examination is complete without this procedure.

At least one-half of the time given to the physical examination should be spent in ausculation. One should find some area on the chest where the normal breath sounds can be heard. Usually in the axilla over the lower lobes normal vesicular breathing is present even in well advanced tuberculosis. One should come back to this area often, in order to get the pitch as the musician strikes his cords. By this method changes in breath sounds are easily detected. One should then go over the entire chest for changes in intensity of the spoken and whispered voice.

I leave the consideration of rales for the last ausculatory measure. The presence of showers of small crackling rales in either apex which occur localized and persist after deep inspiration, expiration and cough, are in my opinion pathognomonic of pulmonary tuberculosis. If these rales can be heard during quiet breathing the disease has probably passed beyond the stage of incipiency. Ausculation of the chest, without having the patient inhale, exhale and cough is not complete, for in the early cases this is necessary in order to bring out the small moist rales. It will be found that it is advisable to examine the chest both in the early morning and during the afternoon, as quite often rales are present in the morning hours which cannot be found during the remainder of the day. Probably due to the increased respiratory activity.

There are certain areas of the chest to which we should give our greatest attention as there are regions of the lung which seem especially vulnerable to this disease. The alarm signs in pulmonary tuberculosis begin to show themselves earliest at the apex of the lung. More often on the right than on the left. The apex corresponds anatomically to the inner portion of the supra spinous fossa. In this region one should look carefully for the ausculatory signs indicative of changes in the lung tissue. Such as altered vesicular murmur, increased vocal resonance, small crackling rales, etc.

Chauvet regards specifically as the alarm zone, a line drawn from the spinous process of the seventh cervical vertebra to the projecting inner tuberosity of the spine of the scapula. It is here on one side or the other we shall most often find our earliest signs. For in this area the apex of the lung is separated from the ear by the least amount of soft tissue, and its relative narrow shape brings tissue changes in its center closer to the observer's ear. This is the point of election for the most careful examination of the lung in incipient tuberculosis.

In a certain percentage of cases it will be necessary to repeat the physical examination to assure oneself that nothing has been missed. If the physical examination has been carefully and exhaustively made there is no other procedure which will give as much diagnostic information.

The finding of tubercle bacilli in the sputum of a patient suffering with incipient tuberculosis is definitely proportional to the diligence of the search. One sputum examination even if carefully made is of little value. One should not stop at less than six. The more the better. I have found them after twenty sputum examinations. It is certain that the absence of bacilli in the sputum of one suffering with incipient tuberculosis is not disproof of the existence of the disease.

Perhaps no single procedure has rendered more assistance in the early diagnosis of tuberculosis as that of the X-ray. Especially is it of great value in doubtful cases. That there is a very early impairment of alveolar permeability to the X-ray is no longer a question for debate. The information obtained from the fluoroscopy is not as reliable or useful as that obtained from the stereoscopic plates, but much can be learned from the fluoroscopy alone, if the examination is made during inspiration and during cough. Normally clearness of the lung tissue increases during inspiration and cough. The air is seen to be passing into the alveoli. Continuous absence of this increase in clearness of the apex during cough or inspiration is a typical, and perhaps one of the earliest, signs of apical disorders.

The treatment of early tuberculosis is most satisfactory in those cases where complete cooperation is obtained. Rest is by far the therapeutic agent of greatest value and should be complete in any case showing temperature at any time in twenty-four hours. It should also be insisted on in those cases not showing a rise in temperature, if other evidence of toxemia or activity exists.

Hypernutrition ranks next in importance and the diet should contain food easily digestible and nutritious. The calorific value of which should be at least one-third greater than the actual calculated nutritive needs of the patient. Fresh air and sunshine, while being secondary in importance to rest and proper nutrition, are measures of no slight value in the management of early tuberculosis. Probably no greater experiment in the history of the treatment of tuberculosis has been tried than that which has been carried out by our government in the care of great numbers of veterans of the World War found tubercular. Hospitals and sanitariums have been established in nearly every part of this country. The careful statistics gathered after four years tell us that patients do as well in one part of the country as in another, other things being equal. If patients improve by being sent away it is because they go away to get well and give themselves up entirely to the task of regaining their health, which a great many are unwilling to do when at home, where old long-established habits are persisted in. I do not believe there is the slightest value in climatic treatment other than that occasionally obtained by a change of surroundings, doctors or medicine.

There are some factors in the treatment of tuberculosis about which I feel certain. The longer in beginning treatment the longer for restoration to health, and the greater the probability that the individual will spread the disease.

In conclusion I wish to make these emphatic statements: The physical examination, if it is worth anything, will take time. It is not too much to expect the general practitioner to be capable of careful inspection where inequalities of posture, musculature or expansion are discernible; to be so adept in percussion that moderate changes in resonance and basal expansion of the lungs yield him the needed information; to know how and where to elicit rales and whether they mean tuberculosis; to be honest, thorough, suspicious, zealous; to examine sputum frequently; to know the absence of the bacilli is not disproof of active tuberculosis, and if he waits for their demonstration he loses most often his patient's chance of arresting the disease. He should avail himself of the X-ray both as a diagnostic and prognostic agent.

Surely no man will find early tuberculosis unless he searches for it.

DISCUSSION.

Dr. L. W. Cunningham, Jacksonville:

The X-ray has played a considerable part in chest diagnosis in many types of lesions, as the lungs, with an air-filled content, give excellent material for negatives of marked contrast and detail. In tuberculosis it has great value in that it indicates the location, the extent and character of the lesion in most instances and is of marked help in the early diagnosis of the disease.

To digress a moment, I would like to stress the importance of technique. Screen study, or the use of the fluoroscope, has a distinct value but should be an adjunct to stereoscopic plates or films. To depend on screen study of the chest is to invite disaster and failure and discredit a valuable agency. Stereoscopic films made so rapidly

that the heart shadow appears as if carved out must be secured in order that the most minute lung markings be seen. This means an exposure time of one or two-fifths of a second. Flat films have value but it is limited, and only stereoscopic films should be considered. Improvement in all kinds of X-ray apparatus, including films and intensifying screens readily allows the rapid type of exposure necessary to the best results.

We are interested in the early diagnosis of tuberculosis of the lungs, and we have a valuable agent but one that is not infallible. We must not fail to impress upon you that collaboration with the internist in the closest manner will bring the best results. You must not depend on the X-ray film alone to make your diagnosis. Much argument and futile discussion has occurred many times over a period of years as to the relative value of the physical and clinical study compared with the X-ray findings and this must not be done. They must not be compared but must be made to fit into one another and thus make a real diagnosis. Collaboration between the internist and the roentgenologist wherever it is followed gives good results. We have studied many hundred of lung examinations with Dr. Harris and it is seldom that we disagree except minutely.

Next we would stress the point that this is not an easy method. Many other conditions produce changes in the lungs that at times are similar to tuberculosis. One in particular must beware of those patients who work in dust of different types, also after influenza, and some types of metastatic malignancy.

In the study of films of the early cases of tuberculosis one has to look for minute changes in the lungs, and some of the slides we will show you will appear to you as normal lungs. This is due to the fact that only in the stereoscopic films can many of the small lesions be seen. But the fact that the slides show so little or no actual X-ray pathology shows the necessity for stereoscopic study. To revert to technique, we would say that no set number of films should be depended upon, but both antero-posterior and postero-anterior sets should be made, and, if any doubt exists, more films should then be made to confirm or disprove some doubtful shadow. Often reporting some doubtful shadow will be of help in the further study of the patient.

We chiefly depend upon changes in the lung itself, although coincident changes in the pleura have diagnostic significance. Changes in the pleura alone are not usually typical but are suggestive evidence, especially if noted at the apex. Changes in the movement of the diaphragm are of distinct value and often lead one to a more intensive study of that side and the finding of evidence of an early lesion. Changes in the lung picture occur more rapidly than one would expect and I have seen marked and extensive acute mottling disappear in a few weeks. It then suggests re-examination at proper intervals as the serial study gives records of the changes and will help to indicate repair or progression of the disease.

We would make the point that Dr. Harris has noted that apparently early cases are not early, but one quite frequently finds evidence of old lesions and an exacerbation acute in type of them or infection of acute type at another point. At times the film study may have prognostic value, but one needs to be more than cautious in this phase of the work.

We would note in closing that the film quite often shows a much greater extent of disease changes than the physical study suggests and this has been a uniform finding of X-ray workers.

We would stress again the value of the X-ray and that the best results will be secured where the internist and the Roentgenologist work side by side and check their work.

Dr. R. H. McGinnis, Jacksonville:

Too much emphasis cannot be given to the keynote in Dr. Harris' paper on the early diagnosis of pulmonary tuberculosis, namely, suspect it, a good, painstaking history of the patient's past illness, environments, exposure to the disease, length of time of exposure, and a careful, thorough physical examination of the entire body, especially the chest.

One examination may not be sufficient. One should be perfectly satisfied with his findings before reaching definite conclusions. While inspection, palpation, percussion and measurements are useful, more time should be devoted to auscultation, as by auscultation evidence is obtained that cannot be ascertained in any other manner. I am not satisfied that the X-ray study gives much definite information in the early stages of the disease as it so admirably does after fibrous changes have taken place in the lung tissue.

One should not be satisfied to pronounce a person free from tuberculosis after one negative test of the sputum. If one is suspicious repeated examinations ought to be made. I had a case a few years ago whose sputum test became positive at the forty-eighth examination. This patient

died one and one-half years later of pulmonary and laryngeal tuberculosis.

Climate, *per se,* has no curative effect on this disease.

Dr. T. Z. Cason, Jacksonville:

I think we should all feel grateful to Dr. Harris for his paper, and for the fact that he has the nerve to say what he thinks on the subject of the diagnosis of tuberculosis. He has said some things that needed saying, and should have been said long ago.

I agree with most of the facts he has stated in his paper. I do think that it is within the province of the general practitioner and within the possibility of the general practitioner to diagnose early cases of tuberculosis. I do think, however, that it does require extraordinary skill to diagnose a great number of incipient cases of tuberculosis. I say that with some timidity. I understand clearly that you are sometimes censured for not making an early diagnosis—but that censure does not necessarily mean that you have not tried. Those of us who do a great deal of chest work, realize that from day to day we have to keep our ears tuned to hear little fine sounds in the lungs in order to make a definite diagnosis. We also realize that from day to day we have to distinguish between certain abnormal and normal sounds, and unless you are in a position to do a great amount of chest work, and to do it daily, I think you will therefore fail to diagnose a large per cent of the more difficult cases.

I certainly agree with what Dr. Harris has said on the question of making a great number of sputum examinations, and putting your best effort into the diagnosis, history, X-ray findings, etc. But let me warn you to be very careful of your X-ray examinations. Now, I think the X-ray men will bear me out in this. There is no one who is quicker to ask for an X-ray than I, but mind you, do not be misled by your X-ray examinations, either in a negative or a positive way. In one of my early cases, I remember, the X-ray man gave me a negative diagnosis, and the patient died in two weeks, and we found multiple disease of the lungs, intestinal tract, spleen, etc., all tuberculosis. I have certainly appreciated that warning. There is something about the X-ray that I cannot explain. There is nothing wrong with the X-ray man at all; he did his work well and did it thoroughly. However, we must not be misled by the X-ray examination—we must be careful.

Last week I was in Atlanta at the National Tuberculosis Association. During their discussions it was brought out that there are a large number of cases having a diagnosis of tuberculosis that are not tuberculosis. An analysis of cases showed over 200 cases that had had hemorrhages, positive sputum, and various symptoms, and yet were not tuberculosis. One man made the statement that he thought he had more undiagnosed cases than he had diagnosed, and for that reason I am sounding that note of warning.

There is one thing in Dr. Harris' paper that I do not agree with, and that is the question of pleurisy. I do not know what he calls idiopathic pleurisy, but I am convinced that there are a great number of cases of pleurisy that are not accompanied by tuberculosis. The old idea that every case of pleurisy is accompanied by tuberculosis will not stand. We saw that after the flu epidemic, when a great number of cases were diagnosed T. B., some of them being pleurisy with effusion, yet on being followed up for a long period of time there was no evidence of tuberculosis. I think we have had two hundred cases that had pleurisy—different kinds of pleurisy—that were not tuberculosis.

It seems to me, then, that one of the things that you must do—that we must all do—is to learn to recognize these cases at once and then keep them under observation, watch them carefully and hold them in suspicion before we make a definite diagnosis one way or the other. We must learn to recognize these cases the moment they come to us and then thoroughly study the patient.

You must remember this point: It behooves us to very carefully follow up cases, make a diagnosis, and do not let him go too long, and yet be exceptionally careful and not make a diagnosis when he is negative.

Dr. L. M. Anderson, Lake City:

I am very sorry that I did not hear all of this paper. I am deeply interested in the subject of early diagnosis of tuberculosis, and I also think that the X-ray is of great assistance to us in making that diagnosis. But I hope that each and every one of us in pronouncing a diagnosis of tuberculosis in its early stages will do it from our physical examination first, and then take up the X-ray afterward.

Now, as to rales: Rales sometimes in incipient stages of tuberculosis are very hard to get. It is also pretty hard to get co-operation, or it seems that way to me sometimes with some of my pa-

tients. I agree wih Dr. Harris that you are more apt to get them early in the morning, I think. In making that examination, get them to expel air and cough properly.

Auscultation is a hard thing to get. You want a properly built up office to get auscultation—to the exclusion of all other noises and interruptions. And then you want your patient to give his attention to you.

Examination by X-ray: This, as Dr. Cason has told you, will get you a good many things, if we immediately show them to the X-ray specialist. There are a few of these cases that you get, if they are old ones, where long walks cause a cough as well as other symptoms, but if given medication for a short time just clear right up.

Now, I fully agree with Dr. Harris in this matter, that rest and sunlight, especially—as much sunlight as you can get—is the proper thing for the treatment of tuberculosis. Also we find, or at least I do, but still a good many of the physicians do not agree with me, that I get some benefit from lime, creosote and iodine. I have not been without, I don't think in thirty-five years, the care of a T. B. patient. But the reason that we general practitioners do not get any better results, I think, sometimes is because we cannot control our patients. If we could put them in a hospital and keep them there, we could supervise their activities, especially the amount of work that they do, and such things as that. Now, I am not going to tell you all about some patients that I have. Some of them are living—I will say that much.

Another reason why we do not make a diagnosis of tuberculosis early: I would like to ask Dr. Harris how many people come to him voluntarily in the actual stages of T. B. Lots of them have pain in the chest, but what per cent of the patients come to you in the early stages with loss of weight, temperature and such as that?

Dr. M. H. DeBoe, Key West:

I want to express my appreciation toward Dr. Harris for presenting such an excellent paper on this most important subject. I want to agree with him in the importance of early diagnosis of tuberculosis, and the use of every means possible in making that diagnosis.

There is one other point which is elicited by ophthalmoscopic examination. That is a dim line of light which is seen running along the arteries of the retina. This sign is not demonstrable where the pupil is dilated by a mydriatic, it is only seen through a normal pupil by direct ophthalmoscopy.

Dr. T. A. Neal, Orlando:

There is just one feature that I want to discuss, and that is the positive statement the Doctor made, if I understood him correctly, in regard to persistent fine rales after deep inspiration followed by expiration and cough being always a sign of tuberculosis. I have seen one or two cases in which I made a diagnosis of tuberculosis, where this existed with still other signs, that were not tuberculosis. Both had loss of weight.

I have one little patient now under observation that I may refer for diagnosis before long to another physician on account of an uncertain kidney condition. He has these chest symptoms which will persist on you, giving all of the characteristics of tuberculosis; however, it seems that this child has a Bright's disease. Has both kinds of granular and hyaline casts, and small amount of albumin in urine. And I am inclined to think that instead of tuberculosis this is a kidney case.

Dr. W. L. Hughlett, Cocoa:

I am sorry that I failed to hear the first part of Dr. Harris' very valuable contribution. I am interested in this subject and would like to ask him to make us clear on the temperature symptoms in the early diagnosis of tuberculosis. I have been on the job a long time and I have found the temperature chart to be a most valuable aid in the selection of these cases for treatment.

Dr. J. G. DuPuis, Lemon City:

In calling attention to the early diagnosis and treatment of this disease, two things clearly remain to be ascertained, that have not been mentioned. Dr. Harris has brought out the methods of diagnosis and treatment of these patients, but what are we going to do with them after they return home? We diagnose them, as he stated, and keep after them until they are classified. Watch out for them if they are T. B. patients. What are we going to do with them after they are found? The average T. B. patient is poor—or they are in our county, and I believe they are in other counties—and what are poor people to do? Why are they poor? So many people become poor because it is hard to find work when their diagnosis is known. Therefore the question: What are we to do with them when we have found them, classified them, and found that they are poor people?

Now, the question of treatment: We say they need sunshine and rest, especially sunshine. Give them sunshine. We say we are going to take care of the T. B. people and create a sensation, but when they are poor, how are we going to do it? It is pretty hard to solve that problem.

Some have tried to prevent the occurrence of this disease in the growing child. That must be done through nutrition. Going back to the fundament of society, the problem of producing that nutrition lies within the work of our agricultural department. If this can be proved—if it can be shown that our diseases are referred back to the nutrition of our youth in the beginning, I believe that will help us.

I spoke of classifying these people. I believe you doctors will appreciate just what we mean by classifying these people. Thank you.

Dr. J. W. Taylor, Tampa:

There is just one point that I would like to mention, and that is the importance of the laryngoscope.

I believe all the laryngologists will bear me out in the opinion that we rarely if ever see a case of tubercular laryngitis in the early stages. When we see that it is usually after a chronic aphonia has set in. Therefore, I believe that every internist should be equipped with a laryngoscope and use it in his cases, because it is only in making an early diagnosis in these cases that we are able to control the laryngeal condition. And in seeing these cases, the normal and the abnormal, why we soon learn to detect the beginning break in the larynx. This is the point I would like to bring out in making that statement about the laryngoscope.

Dr. J. H. Randolph, Jacksonville:

In the early diagnosis of tuberculosis, there is just one point which seems to me is likely to be overlooked, and which will have to be read between the lines in this paper possibly, although I believe Dr. Harris, himself, has had it fully in mind all of the time.

He speaks of the variation in temperature, which he thinks is of great importance, such as the slight variation in temperature which these patients with the early stages of tuberculosis often present. A little later on he also speaks of the neurasthenia or the nervous symptoms which some of these patients present and nothing more. Now, if we will combine these two features that he has mentioned, and keep in mind always the possibility of an early tuberculosis in the patients who come in complaining of nervousness, and in whom you find these slight variations of temperature, and nothing more perhaps, and then make that same careful complete examination which he has urged upon you to determine it, you will probably save a patient from later coming down with a serious and incurable condition.

Too often these cases we all know have functional nervous symptoms, and the patient is told that the temperature that he has is just a nervous temperature or nervous disorder. That is an all too common mistake among all of us in the general practice throughout the State. We send the patient off to rest and take recreation—a very happy solution possibly for the patient, and also for the self-satisfied physician, who feels that he has done the right thing for the patient. Only a few years later, or possibly a few months later, that patient is taken down with early pulmonary symptoms and someone discovers consolidation and disease.

Dr. Thomas Truelsen, Tampa:

The diagnosis of tuberculosis is comparatively easy—that is the average case of tuberculosis is usually quite easy.

Now, percussion is a gross method of examination. It does not get you much information. Anybody with a little skill can demonstrate three or four different things on the chest. Practically disregard percussion, it won't get you much.

Auscultation is the thing that most of us have to rely upon. If you will examine the corresponding sides of the chest, and compare your findings at corresponding points on the other side, and if you detect a difference you have made the first stage of a physical examination. Detect the difference and then you can investigate further. If both sides, over back and front, from corresponding points sound alike you have gained a good deal of information. If you detect a difference on one side, or if there is a pathological lesion on that side, you have got to have increased resonance on that side. Detect the first change in studying the chest, and then resort to some of the other methods of investigation and you will have accomplished a great deal. This is the first stage in most chest work. Examine the corresponding sides, find out whether they correspond in sound both as to auscultation and res-

onance, and then it will be easy for you to distinguish between them.

Dr. H. H. Harris, Jacksonville (concluding):

Before concluding this paper, I want to thank all of the doctors for their very liberal discussions of the paper. This is a very interesting question and would probably take up the whole session if we would let it.

I cannot answer all of the points brought out in the discussions by the different men, or that I would like to say something about.

I feel somewhat like Dr. Cunningham, that it is not given to all of us to have perfectly good hearing, and to be what we might call wizards of the stethoscope, but I do feel that it is given to every one to be honest and when we get where we cannot make a diagnosis honestly and intelligently it behooves that man to send him to someone who can make a diagnosis, after one has failed. We should all realize and know when we are not able to get a diagnosis and should not let the patient suffer but send him to somebody who can make a correct diagnosis. Dr. Cunningham spoke about so many cases being called tuberculosis which are not. I will admit there are quite a few; especially after the epidemic of influenza in 1918 and 1919, we had a great many cases that were very baffling, but they were more than anything else due to chronic influenzal infection which had gotten in the lungs. I fear also that for every case that is called tuberculosis and is not tuberculosis, there are fifty cases called something else that are tuberculosis. I feel that he is almost neglectful of the number of cases that are being called something else—that is when we state our cases frankly.

As to auscultation: A sound-proof room does not make concentration. Now, my office is an outside office in the St. James Building. It gets the shock of big trucks during the day and there is a park within a hundred yards where the band plays all winter—all kinds of jazzy tunes, and I know that I am conscious of everything that is going on. However, I believe that you should bar out all ordinary noises close to you that are apt to distract you. Learn to concentrate on your patient.

As to what per cent of the cases come to me with a diagnosis of early tuberculosis, I could not give the exact per cent, but it would be very small. The majority of cases that I have with early tuberculosis are cases that came to me for something else. I don't make a diagnosis of a man until I know something about him. I sit him down and talk to him first—ask him all about his life, that is, all about his habits, and his work and his family, and finally get down to symptoms, and then down to a physical examination. I spend most of the time on that, and when I get through the examination I make a diagnosis. If that patient comes in making a statement something like this, "Doctor, I think I have T. B.," I show him out. I don't want him to influence me in my opinion. Don't want to make a diagnosis before I get to it. Let the diagnosis be the last and not the first thing.

Now, as to the question of temperature in tuberculosis. That is a very variable thing. I think that temperature above or below normal is a very valuable sign in early tuberculosis. As I stated before, I think the morning subnormal temperature is as characteristic as the slight rise in the afternoon. It is a strange thing about tuberculosis, like toxemia. You will see one patient who is shot all to pieces, with no temperature above normal. And you will see another one with physical signs that show a small area, in the apex, probably not more than one or two inches in size, and that individual will be running 102 temperature, and having night sweats. We do not know why but we know it is so. It may be different kind of treatment and it may be the individual, himself. I had one patient, a young fellow with a total disability, drawing $150.00 per month from the U. S. V. B. His chest is shot all to pieces. There are a great many rales in all portions, clear down to the base. But that man has no rise in temperature, and furthermore has no cough. Just because a patient has no cough, just remember he can still have tuberculosis and have it pretty bad.

A STUDY OF THE MECHANICAL AND CHEMICAL PROPERTIES OF THE SAND SPUR FROM THE STANDPOINT OF THE ENDOSCOPIST AND SOME OBSERVATIONS ON ITS CLINICAL MANIFESTATIONS IN THE LARYNX.*

By H. Marshall Taylor, M. D.,
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The marvelous development of the science of endoscopy has been due to the fact that its different phases have been so closely studied. In recent years investigators have endowed this branch of surgery with pathologic observations which accentuate the importance of the specificity of certain types of foreign bodies in the air passages. Jackson's investigation of the peanut as the etiologic factor in the production of a syndrome to which he has given the term arachidic bronchitis stands out prominently in this phase of bronchoscopy. Such research is conclusive evidence that the study of a series of foreign bodies of the same type and physical characteristics in the air passages will aid the endoscopist in arriving at some valuable conclusions relative to them.

The purpose of this paper is to discuss the sand spur as a foreign body in the larynx. It is an interesting fact, as shown by the literature, that the sand spur infrequently runs "that gauntlet consisting of the epiglottis, upper laryngeal orifice, ventricular bands, vocal cords and bechic blast" to become a foreign body in the lung. In my experience this has been true, and as a result of this fact my observation will be confined to the reaction of the laryngeal tissues to this type of foreign body. When considered from the point of frequency as an intruder in the air passages, a survey of the literature reveals relatively few references to it aside from merely reporting its extraction and perhaps localization.

In my experience with the sand spur as a foreign body, some facts were observed which aroused sufficient interest to stimulate some definite study as to the chemistry and mechanical properties of this noxious weed. When one considers the fact that there have been reported in the literature eighty-five cases in which the sand spur has occurred as a foreign body, it would appear that some investigation as to its inherent and mechanical properties would be justified.

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To Linnæus belongs the credit of naming the plant as it is known to botanists today. The species which I have seen as a foreign body in the air passages is the Cenchrus tribuloides (Fig. 1), which is commonly known as sand spur, sand

Fig. 1. Cenchrus tribuloides L. x 1-3. (After Youngken and LaWall.)

bur or cockspur. It is an annual weed belonging to the family Graminæ. It is widely distributed, occurring from Ontario and Maine to Florida, westward to Minnesota and south to Colorado and Texas. In the far South near the coast it is a very common plant and may be found almost anywhere, on lawns, in cultivated fields and waste places. This grass thrives in sandy soils, and since it roots at the nodes or joints it frequently forms dense mats. The fruits of this grass are spiny burs, and it is to these that the endoscopist who resides in a section of country where this plant is indigenous and abundant has his attention frequently called.

It is a fact recognized by those who have carelessly handled this troublesome weed that the trauma or wounds caused by the spines of the involucre of the Cenchrus tribuloides are usually painful and long-continued. Observing persons familiar with the sand spur state that the wounds from the younger spines are more painful than

the injury from the spines which have reached the stage of maturity. Personal experience with the sand spur before studying it from the standpoint of a foreign body in the air passages led me to believe that there was some irritating principle about the spines of the Cenchrus tribuloides that other spines did not possess. After encountering it a number of times as a foreign body in the larynx and observing a similar and very definite characteristic type of inflammation in each case, I was prompted to undertake an investigation of the mintue structure, histology and chemistry of the sand spur with the idea of determining the cause of the clinical manifestations.

A review of the literature on Cenchrus tribuloides was therefore undertaken. Apparently no work was published on the histology of these plants until 1892, when Gayle published in the *Botanical Index* a brief article in which he described and illustrated the lower portions of the spines of the fruit. He states that "the spines are barbed, that each barb has within it a cavity terminating, in the direction of the point, in a narrow tube which is filled with a substance having a light purple color." He adds that in all probability this substance, which is of a highly irritating nature, may be assumed to be the direct cause of the inflammation of the wound.

To ascertain whether there is any toxic principle in the substance which has a light purple color described by Gayle, and to determine the cause of this definite type of inflammation, an exhaustive study of the plant under discussion was deemed essential. At the request of the author, Dr. Charles H. LaWall and Dr. Heber W. Youngken of the Philadelphia College of Pharmacy and Science consented to undertake the investigation of the sand spur. At their request, two pounds of sand spurs were gathered and submitted to them. For the information on the anatomic and microchemic part of this work we are indebted to Dr. Youngken, while Dr. LaWall investigated the chemistry of the mature burs with contained fruits.

While the histology of the sand spur may be principally of academic interest, it has its important bearing clinically when studied in the role of a foreign body in the air passages, and it is worth while here to call attention to certain facts pertaining to its minute anatomy.

Dr. Youngken states the burs of the Cenchrus tribuloides present a somewhat rounded polygonal outline when observed on tranverse sections and exhibit numerous outgrowths in the form of long attenuated spines (Fig. 2).

The spines originate early in the development of the bur as outgrowths of its tissues. In their

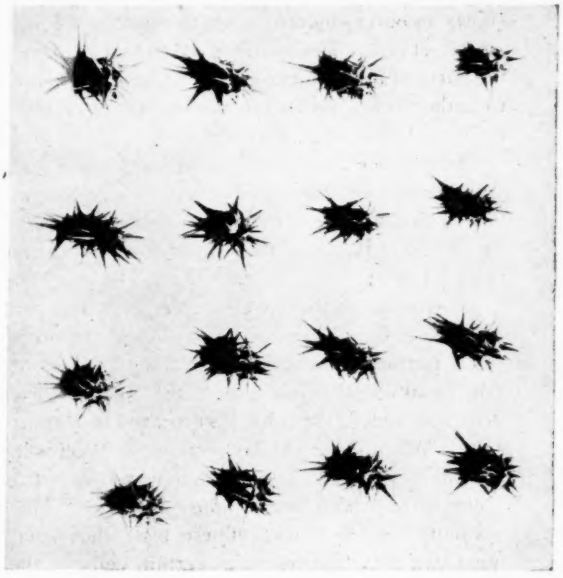

Fig. 2. Burs of Cenchrus tribuloides L. (After Youngken and LaWall.)

young condition they are often purplish red or bluish, but gradually lose their color and become yellowish brown. They are for the most part flattened and conical in shape, with sharp attenuated distal ends. They are clothed with hairs (Fig. 3) in their proximate third and exhibit

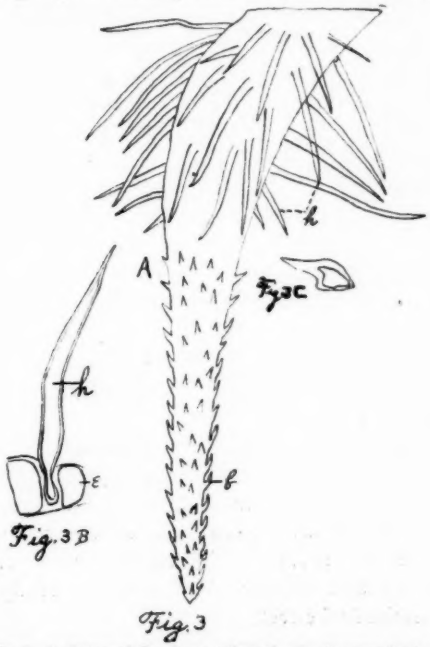

Fig. 3. A. Spine of Cenchrus tribuloides L. showing barbs (b) below and unicellular hairs (h) above. B. Portion of epidermis of spine showing insertion of hair (h) between epidermal cells (e). C. Barb enlarged. (After Youngken and LaWall.)

sharp recurved barbs for the remainder of their length. The barbs readily break at their tips when pressure is applied to them. Each spine shows an outer epidermis, which consists of long and short cells. The purplish red to blue color of the parts of the younger spines is found to be due to anthocyanins present in the cell sap of certain epidermal cells, fibers and barbs.

The surface and longitudinal sections of the younger spines show purple and blue cell sap. These elements were examined microchemically by Dr. Youngken, and the substance of his report is as follows:

When thin sections were placed in a ten per cent alcoholic solution of ferric chlorid the originally purple or blue cell sap became red in about one minute. When concentrated hydrochloric acid was added, the color disappeared in a short time. When other similar sections with cell sap originally purple to blue were mounted in a 1:5 solution of silver nitrate, the purple and blue contents became black. These tests show that formates may be present in certain cells of the epidermis, as well as in a number of sclerenchyma fibers and barbs of the younger spines. Dr. Youngken further states that the surfaces and longitudinal sections of mature spines show the elements to be entirely devoid of the purple and blue cell sap contents noted in the case of younger spines.

Dr. LaWall, after examining the mature sand spurs pulverized in an iron mill to a fineness of a No. 60 powder, states that after they have reached the stage of maturity they are not actively toxic.

For a further analysis Dr. Youngken placed the burs in a weak alkaline solution for several hours and subsequently examined their spines microscopically. He reported that the epidermis appeared broken and the sharp pointed sclerenchyma fibers more or less detached.

The author regards himself as fortunate in having had a sufficiently broad experience with the sand spur in the larynx to be able to compare its direct effects on the laryngeal tissues with that of other foreign bodies of different physical characteristics.

The endoscopic picture of those cases in which the foreign body had been in the larynx for more than twenty-four hours and the prolonged hoarseness after removal were the two factors which led me to endeavor to isolate some inherent property in the sand spur and suggested the study of its mechanical effect.

An analytical survey of ten cases in children in which the sand spur had been in the larynx for more than twenty-four hours presented a concrete picture in many respects resembling laryngeal diphtheria. The children were more or less prostrated and gave evidence of a toxemia which was manifested by a temperature varying from 100° F. to 102° F., by a pulse ranging from 100 to 140 and by a mild cervical adenitis. A marked hoarseness and increasing dyspnea were prominent symptoms and in some cases a varying amount of cyanosis was observed. Direct laryngoscopy showed a dirty grayish exudate elevated above the surrounding mucous membrane and the neighboring area to be inflamed and sometimes edematous. In a number of cases the foreign body was recognized with considerable difficulty, because it was obscured by this thick grayish membrane. Cultures taken from the exudate in no instance revealed more than a mixed infection.

Second in importance to this clinical picture was the marked and prolonged hoarseness which persisted for weeks after the foreign body was removed. In two of my cases, six weeks after removal, there was a marked difficulty of phonation and such a degree of hoarseness as might be associated with a laryngeal neoplasm.

After observing this syndrome in my earlier cases I perused the literature on the subject in search of an explanation. A careful study showed no evidence of any chemical work having been done on the sand spur at any time in its history prior to the study recently completed by Dr. Youngken and Dr. La Wall.

Without some consideration of its minute structure, one can hardly appreciate the amount of trauma to which the laryngeal mucosa is subjected when the sand spur with its thirty to forty spines with their retrorse barbs, as illustrated in Figure 3, becomes jammed in the glottis. With the penetration and traumatization of the epithelium, the resistance of the tissues is lowered, subjecting these numerous wounds to invasion by pyogenic and other bacteria. In additon to the laceration of the tissues and the microbic invasion, can also be added the irritation by the formates which occur in the lumen of the barbs of the younger spines, and which may be injected into the wounds upon fracture of the sharp brittle tips of these structures.

Dr. Youngken also calls attention to another factor in the production of this inflammatory proc-

ess due to the sharp sclerenchyma fibers becoming loosened and detached in the flesh fluids.

The prolonged hoarseness which in some of my cases persisted more than six weeks after the foreign body was removed can be accounted for by the fact that these retrorse barbs, as shown in Figure 3, are broken off when the main spine is removed and remain in the laryngeal mucosa for an indefinite time. I examined several of these spines from the sand spurs which I had removed from the larynges and discovered that these small barbs were missing, evidently having been left in the laryngeal mucous membrane.

CONCLUSIONS.

1. The pronounced and prolonged irritative action of the sand spur to human tissue can be explained by an understanding of its mechanical and chemical properties.

2. The early development of an inflammatory exudate when the sand spur is lodged in the larynx is evidence of the marked irritative action of this type of foreign body.

3. The appearance of the larynx in which the sand spur has been lodged for more than twenty-four hours presents a picture resembling laryngeal diphtheria.

4. The penetration and traumatization of the epithelium by the numerous spines of the sand spur lowers the resistance of the tissues and permits the invasion of pyogenic and other bacteria.

5. The amount of reaction of the tissues is increased by the formates, which may act as a mechanical and toxichemical irritant. These formates are contained in the younger spines.

6. The prolonged hoarseness after removal can be attributed largely to the fact that on removing the main portion of the numerous spines the retrorse barbs are broken off and remain in the tissues of the larynx.

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ACUTE OSTEOMYELITIS*

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The advent of an acute pyogenic infection in one or more of an individual's bones is a pathological catastrophe which often, within a few days after onset, condemns the individual to months or even years of suffering, and frequently leaves him with a permanent disability; therefore whatever we may do during the short time at our disposal in the beginning of the disease, which promises to check its progress, even though it seems radical to us and to the patient at the time, is well worth doing.

Realizing that a long, tedious paper, including a summary of all the available knowledge upon the subject in question is inclined to be tiresome, and should be presented only to audiences of special societies, I have chosen to discuss in a brief way this very important subject, with the definite purpose in view of focusing your attention upon only two points which, in our experience with this disease, constitute the two most important principles in limiting both the time and the amount of disability resulting from this pathological catastrophe.

The first point is the absolute necessity of early diagnosis, and immediate and fearless treatment.

The second point is the advisability of conservatism in the care of these cases after the

*Read before the Fifty-first annual meeting of the Florida Medical Association, held at Orlando, May 13, 14, 1924.

primary operation, and the necessity of having very clear-cut indications for whatever is done as a secondary operation.

You will see, therefore, that our attitude is quite radical in the beginning, and quite conservative in the later stages.

Purposely omitting reference to the many variations in the etiology and pathology of this disease, in order that the picture may be rendered free from the clouds which usually attend such pictures, when presented in the midst of all their modifying clauses, I am going to describe the usual sequence of events occurring in a case of this kind, in an attempt to show why a diagnosis should practically always be made during the early course of the disease.

Constituting the background of our picture we have a child between the ages of five and twenty years, whose general resistance has been impaired by some febrile disease, and who has some focal infection, frequently furuncles. A staphylicoccicæmia is most likely present. This constitutes a potential case of acute osteomyelitis, and should always be so regarded by the attending physician.

Suddenly a rapidly progressive picture of bone infection appears upon the background. A septic embolus lodges in the cancellous end of the diaphysis of one of the long bones, an abscess forms and rapidly increases in size during the first few hours.

During this stage the pathology gives rise to the appearance of a severe, deep-seated, throbbing pain near the site of the infection, and possibly referred to the nearest joint; tenderness to deep and continued pressure; rise of temperature and pulse rate, and an increase in total and polymorphonuclear leucocytes. The diagnosis should be made at this stage of the disease upon the above symptoms.

Twenty-four hours later the abscess has extended into the medullary canal of the bone; possibly the nutrient artery has been occluded by pressure, and the life of a considerable part of the shaft of the bone placed in jeopardy.

The temperature, pulse rate, and leucocyte count go higher and pain and tenderness increase. There is still no swelling, edema, nor redness of the soft parts overlying the involved bone. The diagnosis, based upon the clinical picture, should be a relatively easy matter at this stage of the disease.

During the next few days the pathologic picture continues to change rapidly, the pus filling the medullary cavity of the bone; extending through the cortex to the sub-periosteal space, dissecting up the periosteum from the shaft of the bone, and depriving it of its blood supply; breaking through the periosteum into the muscle planes, and at times into the nearest joint.

It is during this stage, when sub-periosteal infection has occurred, that we begin to note the local swelling, edema, redness and increased local temperature of the soft parts. The diagnosis should be unmistakable at this stage, and yet most cases are not referred to the surgeon before this time.

I have purposely not mentioned the X-ray up to this point, because I feel that this feature of the diagnosis needs especial emphasis. Granting the truth of all the wonders of the X-ray, and admitting our increasing dependence upon it in many fields of diagnosis, I must say that I think the victims of acute osteomyelitis would be better off, as far as early treatment is concerned, had it never come into such general use. Negative X-ray findings have been the cause of fatal delay in treatment of numberless cases of acute osteomyelitis, by giving a false sense of security to both physician and patient during the early stages of the disease. In order for the X-ray to show any evidence whatever of disease in a bone, there must be a change in density of the inorganic bone salts, either bone destruction or bone production, and while osteomyelitis is a disease causing both processes, neither occur during the first four or five days of the disease, when surgery offers its best hope of constructive service.

My contention, therefore, is that the diagnosis should always be made upon clinical and laboratory evidence, and that X-ray examination is absolutely useless during the first few days of the disease.

The objects to be attained in the treatment of this disease are, first, the saving of the patient's life; second, the saving of the patient's limb, and, third, the restoration of that limb as near as possible to normalcy, in the shortest possible time. Incision and drainage of the abscess in the bone at the earliest possible moment after it begins, in the simplest, most direct, and least traumatizing manner, is, we believe, the best way to accomplish these ends.

Our method is to localize as accurately as possible, the point of greatest tenderness in the bone; make an incision at this point; incise and slightly reflect the periosteum; make two or three drill

holes into the medulla with the motor drill, and connect these up with the motor saw, cutting a gutter into the medullary canal, and inserting a rubber tissue drain. Under no circumstances do we sponge out, curette, or in any other manner attempt to remove the products of infection. We believe that this accomplishes nothing but injury to a possibly surviving and very useful endosteum.

This disease can destroy in three days what it takes the forces of nature, plus the efforts of sound, conservative and sensible surgery, months and years at times to repair by the gradual expulsion of dead bone, and its replacement by osteogenisis. No one who has labored with many cases of chronic osteomyelitis for months upon months will question the wisdom of limiting the amount of bone destruction as much as possible by providing a very early avenue of escape for the products of the infection.

If early operation for acute appendicitis is advisable, then early operation in acute osteomyelitis is imperative.

If exploratory laparotomy in cases of undetermined abdominal pathology is warranted, then exploratory tap of the medullary cavity of the long bones, in cases of early suspected osteomyelitis is advisable.

Out of ten cases, I would rather subject nine to unnecessary and harmless exploration than let one go until a positive X-ray diagnosis of osteomyelitis could be made.

Concerning the post-operative care of these cases, and the advisability of secondary operations, we have become more and more conservative. We have repeatedly seen what was considered as dead bone by X-ray study, and by actual inspection remain in position and participate in bone repair, whether by virtue of unrecognized areas of living osteogenetic bone, or in the capacity of a scaffold, such as is furnished by a dead graft, it is difficult to say.

Until a sequestrum is entirely separated from its host, and completely surrounded by granulation tissue, it is a very difficult matter to know how much of it is going to result in total loss, and therefore how much should be removed. We feel that secondary operations for removal of sequestræ should only be done upon very clear-cut indications; that we should know as accurately as possible that separated sequestræ exist; and that their number, size and location should be known before the operation is done. We feel also that the operation should be accomplished with as little sacrifice of living bone as possible. We believe that removal of the entire shaft of the bone is rarely indicated, and that it is followed often by unpreventable deformity in contour of the extremity, which renders the final result little to be preferred to an amputation. Indeed, some of these cases finally come to amputation as the only relief for the deformity. We have seen such wonderful reparative changes occur with the lapse of time, in what, from X-ray appearance, seemed such badly diseased long bones, that conservatism in this stage of the disease has been forced upon us. In our opinion opening up sinuses and blindly curetting the bone is a useless and unnecessary procedure, as the small sequestræ will be spontaneously discharged, and the larger ones, and those inclosed by involucrum will not be reached by this procedure.

We wish in conclusion to leave the following points impressed upon your minds:

1. The period in acute osteomyelitis during which conservation of bone is most likely to follow surgical intervention is during the first seventy-two hours.

2. The diagnosis should be made during the first forty-eight hours of the disease, upon clinical evidence alone, as the X-ray does not show changes in the bone until it is too late for surgery to save it.

3. Secondary operations should only be done with a very definite end to be accomplished; either bettering of drainage, or removal of definite sequestræ which have little chance of being spontaneously extruded.

DISCUSSION.

Dr. John E. Boyd, Jacksonville:

Early diagnosis: As Dr. Simpson has told you, this is the one thing in acute osteomyelitis that robs a serious and dangerous disease of its poison fangs. I quite agree with the essayist in stating that an exploratory operation in a suspected osteomyelitis is as justifiable as a suspected obstruction of the bowel or any other acute abdominal condition.

Roentgen examination useless: I feel it is valuable as a negative finding, providing the doctor is versed in the disease.

A diagnostic point: I picked up this in the course of my reading and it does help, when added to other symptoms. Gentle pressure over the shaft at a distance from the point of greatest pain. At first such gentle pressure produces no

reaction at all, but after a moment, very suddenly, the pain becomes extremely severe, and the patient will cry out or suddenly sit up.

Early exploration of the medullary cavity in suspected cases: The primary area of infection is practically always in the medullary cavity. The amount of destruction of bone cortex depends on the extent of involvement of the endosteum and periosteum. Again the subsequent bone repair is dependent on the endosteum, periosteum or both. What I desire to stress is, of course, not new to the experienced surgeon, but to the inexperienced one it may lead to serious results for the patient. Having made the skin incision, in the very early cases you will find the following: The periosteum overlying the involved region is hyperæmic, pinkish in color, and heavy with œdema. On separating the periosteum from the bone-bleeding is more evident than it is in the normal condition. On opening the marrow cavity with a bone drill or trephine, as is the usual custom, the normal fat tissue which ordinarily will not flow has a melted appearance and oil may even be seen oozing from the marrow spaces. At this incipient stage one may find no pus whatever and it is during this time that operation accomplishes the most good, since if the medulla is well drained at this time the infection may be checked absolutely so that medullary and cortical necrosis do not occur at all. Dr. A. J. Ochsner of Chicago has laid great stress on this point.

Repeated operations: I desire to coincide with Dr. Simpson in his advice against this practice. In my humble opinion it is little short of criminal. If your primary operation has been performed with a knowledge of the disease and the exercise of experience subsequent operations rarely become imperative. A patient conservatism may try your guts and lose you the confidence of the patient and his friends, but far better this than a sacrifice of surgical end result and at times a sacrifice of the patient's limb.

Subperiosteal resection: I have no personal experience in this operative procedure, therefore I am going to take the liberty of quoting from the article of Dr. Howard L. Beye of Iowa City, Iowa, which appears in the December, 1923, *Surgery Gynaecology and Obstetrics.* After reviewing the subject his conclusions are:

(1) It is impossible to determine accurately, at the time when it is advised that the operation be performed, just what portion of the involved bone is necrotic.

(2) The second fundamental error in the operation of subperiosteal resection is to assume that regeneration will take place adequately from the remaining periosteum following resection. In stripping the periosteum from the cortex the most actively osteogenic portion of the whole bone may be left on the shaft and removed with it.

(3) The third fundamental error in this operation is that the procedure is very likely to be followed by deformity. In cases in which regeneration of bone is complete and rapid, and the resected bone is splintered by a neighboring bone, the deformity may be practically nihil. In cases in which a long period of time elapses until a new shaft has developed, very definite shortening of the reformed bone may take place.

Dr. L. W. Cunningham, Jacksonville:

In discussing acute osteomyelitis the most important point we would make is when you are dealing with an acute virulent bone infection you must not depend on the X-ray film to make your diagnosis but let the clinical picture be your guide and establish proper surgical drainage. It will be four to seven days before the process of decalcification has advanced to the point where definite evidence is present on the X-ray film. A negative X-ray report must not lead the surgeon to consider some other lesion, but he must be impressed with the fact that the infection and decalcification of the bone do not progress with equal rapidity and operate if in doubt. Serial film study is of great value when it can be had. Study of the bone picture from day to day will allow one to secure the earliest X-ray evidence. When definite X-ray evidence is present in the form of loss of bone density in the worm-eaten type or localized area the infection is in a sense no longer acute. Nature at this point is as a rule building up a barrier of new bone to the infection. Cases operated at this stage of the disease will have a much longer course and likelihood of greater disability. Where they are opened early and only pus found the recovery is much quicker with less bone destruction and formation of sequestra.

We are speaking of the acute pyogenic infection of bone which may begin in the medullary canal, as a periostitis or as an osteitis, meaning involvement of the cortex of the bone and extend to the canal. We might also mention the type seen in compound infected fractures and again that type that results from the direct extension from an abscess in adjacent soft tissue. We quite

recently saw one of the latter type which presented an absolutely normal bone picture on the film but approximately a week later showed an osteomyelitis. Surgical interference in this case had been delayed by ignorant parents.

If an acute bone infection is allowed to continue without surgical drainage it will extend the full length of the shaft and frequently pierce the cortex of the bone and invade the soft tissues. Sequestra will be formed and a long, tedious surgical condition results. While it is aside from the title of the paper we would like to stress the point of conservatism in the removal of so-called dead or softened bone. Sequestra when definitely present need to be removed and we would note that it is far from easy to always recognize one when present. They are frequently surrounded by dense bone that nature is building in the process of repair or overlapped by several areas of different type. Much bone that is and was removed is not dead and if allowed to remain will be used by nature as a ladder to build new bone upon. We would again stress the point that in acute osteomyelitis of pyogenic type there is no typical appearance of the X-ray film till four to seven days have elapsed. That the clinical picture must be the guide of the surgeon. That if one must delay, serial film study from day to day should by all means be done if at all possible.

Dr. R. M. Harkness, Lake City:

I want to emphasize one point that Dr. Simpson made in his paper, by confessing a mistake of my own. We don't like to confess our mistakes, but it is good for us and possibly good for others, too.

About three years ago I made a diagnosis of acute osteomyelitis in a child, an infection in the femur, and allowed my judgment to be warped by a negative X-ray. I knew we had an acute infection, so we opened down to the femur and found a little pus under the periosteum, and perhaps if I had had Dr. Boyd's experience I would have had sense enough to open up this bone, which I did not. This case was relieved of the acute symptoms at the time and went out of the hospital apparently convalescent. This patient has gone from doctor to doctor, including a chiropractor, for the past three years.

Just a few days ago this patient came back to me and I removed a sequestrum involving practically the whole shaft of the femur, which would not have been necessary had I drained the medulla when this case was at the incipiency of the disease.

Dr. J. S. McEwan, Orlando:

Probably you have had more meat out of this paper than any other paper that has been read before this meeting. There were just the right things said and no more.

The question of diagnosis, of course, is the principal thing, that is pain, tenderness, temperature and a high leukocyte count. The early diagnosis is the important thing in acute osteomyelitis —and the early operation.

I cannot add anything to what the Doctor has said, because he has said it all. The principal thing is to operate in your first twenty-four or forty-eight hours if you can, and not after a week or so. As the Doctor said, open up the bone, but do not curette the medulla. If you wait a few hours, you have a septicemia, as a rule.

You men who have handled many of these cases know you have a sick patient, and that many of them die. The Doctor has discussed the two important things, early diagnosis and early treatment.

Dr. J. Knox Simpson, Jacksonville (closing):

I just want to thank the gentlemen who have so kindly discussed the paper, and to say that I am deeply pleased to have my very good friend, Dr. Cunningham, back me up in what I had to say about the early X-ray findings, or rather the absence of early X-ray findings.

I do not want to leave the impression that I do not recommend the X-ray. I do. I utilize the X-ray at every possible point, in everything that I do, but as Dr. Boyd says, everybody does not know how to interpret X-ray films, and a simple statement from the Roentgenologist that the X-ray examination was negative may mean to some men that there is no disease in the bone. That is not the case. They do not intend that as their conclusion—they simply say that the X-ray examination is negative. That may, or may not, mean that there is no infection in the bone.

NOTES ON LUNG PATHOLOGIES OTHER THAN TUBERCULOSIS*

G. RAAP, M. D.,
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Osler's dictum advises us to know tuberculosis and syphilis as a basis for the entire study of medicine. And in either a clinical or Roentgen study of chest pathology, an intimate knowledge of tuberculosis is essential to competent diagnosis. The Roentgen findings in a well-marked case of nephrolithiasis are so characteristic that it is a simple matter to recognize its shadows after one has seen the X-ray film of one such case. Pathologies of the chest, however, offer so many vagaries, their Roentgen manifestations resemble each other so closely, progress and repair, and pathology in other parts of the body play so great a role, that even the most competent in the field of Roentgen diagnosis are frequently at sea to differentiate in certain cases.

We cannot emphasize sufficiently the importance of a thorough knowledge of thoracic pathology, not only pulmonary, but also pleural, cardiac, mediastinal, and experience has shown us that we must include in this list focal infection, bone pathology, and systemic pathology as well. To many a so-called Roentgenologist, one post-mortem examination, with special reference to the thorax, would be an eye-opener. I have in mind one professor of Roentgenology in a Class A medical school who offers a course of Roentgenology to post-graduates, who admitted to me that he had never seen a sectional lung. I would as soon entrust an interpretation of chest pathology to one of Dr. Abram's followers.

Practically all incipient pulmonary pathology, at some time or other, gives the symptom complex of a focal infection. If we keep this in mind whenever a patient presents himself with the complaint of fatigue, malaise, loss of weight, rapid pulse, slight fever, occasional spitting of blood, and we find a few rales, localized or general, and we assure ourselves that all else has been ruled out before we make a diagnosis of tuberculosis, we will increase our average of correct diagnoses. We may be correct in the great majority of cases, but the minority cases are the trouble-makers—those that do harm to our reputations.

A brief review of the essentials of the anatomy and the pathology of the disease is essential to an understanding of the various changes which may occur in the appearance of the lungs, and it is necessary to apply these points in the reading of every chest film. Allow me to quote in part from the work of Miller and Skavlem, with occasional digressions of my own:

"Anatomically, in the upper lobes, we have the vertebral, first and second interspace trunks, with their anterior and posterior divisions. On the left side we have in addition the long branch which runs down into the lingual tip of the upper left lobe. Below the main stem bronchus to the upper lobe, we see the trunks to the middle lobe on the right side, running anteriorly. The branches to the lower lobe all arise from a main stem bronchus, and except for anterior and posterior divisions have no special classification. These landmarks are essential to a localization of a lesion in the parenchyma of the lung."

Recent work from the Mayo Laboratories would tend to indicate that the shadows we see in the normal lung, and which we always thought were cast by the walls of the bronchi, are shadows cast by the walls of the arteries which accompany the bronchi. At any rate, we know that the density of these landmarks is determined most by the changes which take place in the connective tissue containing the bronchi, blood vessels, lymph vessels and glands.

Lymph Flow.

"The normal lymph flow through the lung, which occurs from the lung toward the hilum, except for a small area which is immediately under the pleura and which may drain into the pleural lymphatics, has a vital bearing on the pathology and progress of disease."

Septa.

But of prime importance to the reading of an X-ray chest palet is a thorough understanding of the septa of the lung and their influence on the pathology. Septa are prolongations of the connective tissues from the pleura down into the lung. These connective tissue septa, rich in lymphatics, act as excellent barriers to the spread by continuity of any lung pathology characterized by exudation. Inflammatory exudation starting within any of these small compartments between two septa, anatomically known as the "secondary lobules of Miller," is definitely limited by these barriers. Spread through these barriers will not take place until cavitation occurs. The localization and restriction of the pathological changes by these septa, accounts for our localized rales

*Read before the Dade County Medical Society, at Miami, August 1, 1924.

and also explains so-called "fans." The fans may be present in any lung lesion characterized by exudate. The cellular elements of an acute pneumonia, apical catarrh, pneumoconiosis, infarct, are all held in check by these septa and can consequently furnish localized rales, and fans on an X-ray film. But the differentiation of these lesions can be made by a further study with an understanding of the progress of the pathology in question.

Reaction to Tuberculosis.

Upon the implantation of the tubercle bacillus in a sensitized individual, or the implantation of the pyogenic organisms in non-resistant individuals, an exudate is the first reaction. Just as is the case on the injection of any foreign protein, this exudate is at first of the polymorphonuclear type. But in tuberculosis especially, this lasts only about forty-eight hours, and is then replaced by mononuclear exudates and endothelial cells. This gives us our characteristic microscopic picture of tuberculosis. It may be either minute or massive, but must be massive to show us Roentgen findings, and personally I rather doubt the Roentgen report which states that "tubercles are seen along certain markings," no matter how carefully the films were made, for in the last analysis, the X-ray is not a microscope.

Given a tuberculous infection in a sensitized individual, the pathology advances through the stages of serious exudate, cellular exudate, fibrosis, caseation, calcification, or it may not tend toward healing and go through the stages of cavitation and bronchopneumonia by aspiration. In most well advanced cases and in many of the fairly early cases, we see lesions of at least two of these stages, characterized in the film by their differing densities. In incipient or apparently advanced cases, this is the chief differential point in the diagnosis of tuberculosis.

Other Exudates.

As we stated before, any exudate thrown out into the lung tissue will be limited by the septa. Therefore any lung inflammation with exudate can produce a fan-shaped density. An infarct with its outpouring of blood elements will produce such a density, but its location is usually atypical and its density readily shows us that it is in all probability not a lesion due to a tuberculous infection. If there are several infarcts, they will in all probability be of the same pathologic state, and will all be of about the same density.

Traumatic Densities.

Case No. 664.—This patient showed clinical findings in the right axilla which prompted the clinician to ask for an X-ray examination. Upon study of these films, the question arose as to the cause of this cone-like shadow which appears to lie between the upper and middle right lobes. Upon questioning the patient again, it was found that some weeks previously he had fallen from a telephone pole. This is in all probability the shadow of a hemorrhage outside the pleura at this point. It obscures the ribs so that we are unable to state whether or not there has been a fracture of the rib in this area. The question was asked, "Can this be an infarct?" but the stereoscopic films show that this shadow has somewhat distorted the arrangement of the peripheral trunk markings, and it was therefore our impression that we might rule out infarction. Infarction also usually is secondary to thromboses in other parts of the body or occurs with chronic cardiac lesions or septic infections.

The Pneumonias and Influenza.

The pneumonias, when typical, are easily differentiated from other pathologies, but the intermediate stages, the incipient, and the resolving stages may lead to confusion, and certain atypical types of pneumonia may be confusing. In many of these cases, it is essential that the Roentgenologist be acquainted with the history of the case. After the uniform, sharply defined, lobar density of a frank pneumonia has disappeared, thickened bronchial markings and enlarged glands may remain for a long period, and may simulate any one of a number of chronic lesions. In bronchopneumonia, the differentiation must be made from abscess, bronchiectasis, malignancy, caseous bronchopneumonia from tuberculosis, largely upon the course and clinical history. Unresolved pneumonia must be distinguished from interlobar empyema, tuberculous pneumonia and bronchial stenosis by clinical and laboratory findings.

The recent influenza epidemic brought many of these atypical pneumonias to our attention. The most confusing type was what Sante calls "hilus pneumonia" and what Ewing called "critical pneumonia" because of its rapid fatality. These resemble the picture of tuberculosis in children, although they occur more often in adults, they may be present over so long a period as to suggest a tuberculous etiology, and they may show tubercle bacilli in the sputum, and they

may show cavity formation in the hilus region. These are in all probability not tuberculous in etiology, but they certainly give us a confusing clinical and Roentgen picture. In a series of twelve cases which Sante studied, no definite consolidation was noted, yet the process is very evidently an inflammatory one, and when it involves the hilus glands in the presence of tuberculosis, it may recur, possibly by repeated breaking down of tuberculous glands in the hilum region. In the cases which recover, however, restoration is always ultimately complete.

Bronchitis.

Acute bronchitis gives no characteristic picture, but the chronic bronchitis in certain stages present the appearance of a healing tuberculous lesion with its increased density of the bronchial markings and glands. Here again, the differentiation lies not in a study of the bronchial markings, but in a study of the parenchymatous tissues. If a patient has a bronchitis which is differentiated from tuberculosis with so much difficulty, I feel that I would rather tell the patient that they have a bronchitis than to frighten them with a diagnosis of tuberculosis.

Lung Abscess.

We have seen one case of lung abscess which was being treated as a tuberculosis, and had been considered a far advanced case for six months. Surgical procedure brought this patient back to his duties as a policeman in six weeks. The localization of some of these abscesses is an easy matter, but in other cases, even the most accurate methods fail. Dr. Sante of St. Louis demonstrated at the Chicago meeting how the Hirtz compass could be used to localize these abscesses very accurately. This method requires considerable practice, however, and it would be inadvisable for the average Roentgenologist to attempt it in the sporadic case which occurs in the average practice. Abscesses may also be confused with bronchopneumonia, bronchiectasis, and rarely a metastatic tumor.

Bronchostenosis.

Bronchostenosis due to foreign bodies, aneurism, tumors and lues give a uniform increased density in the area supplied by the affected bronchus, and the movements of the diaphragm are restricted on the affected side. The history of these cases is essential to guard the Roentgen interpretation against error, but if a localized pneumonia sets in, or by chance the foreign body allows air to pass in but not out of the lung, the picture becomes a confusing one.

Anaphylaxis.

The law of probability has often been your salvation, as clinicians, and when certain cases occur as frequently as they do in some of our recent epidemics, your diagnosis is influenced greatly by the epidemic disease. So also in our field. But to show how sensitive the Roentgen appearance of the chest is to minor details and how guarded must be our diagnosis, Liss of Cornell rayed thirty-three chests before and after the inoculation of triple typhoid vaccine and found that all of these cases showed pulmonary or hilum changes, involving the apices, the peribronchial markings and the parenchymatous tissues. We have noted asthmatics in whom the elimination of a diagnosis of incipient tuberculosis was a difficult matter, and due to the fact that we were unable to study these chests at repeated intervals, have never been able to observe the changes due to anaphylaxis. There is no doubt that they do occur. This is a problem well worth intensive study.

Sinus Infection.

The work of Mullen and Webb in Colorado Springs first called attention to the possibility of a relation between sinus infections and the group of cases which we commonly call bronchiectasis, purulent bronchitis, apical catarrh, and asthma when we are unable to find tuberculosis in the X-ray film, but do see certain mild changes which do not allow us to give the patient a negative diagnosis. Dr. Dunham found that in reviewing 389 cases, most of them referred by able clinicians as tuberculous, that 28 per cent of these were suffering from other foci of infection. In the vast majority, this focus of infection was found in the head. We read the statement recently, "every case of bronchitis is accompanied by sinus disease." This may be too dogmatic, but certainly many of these cases do have their focus of infection in the sinuses, and what is more important is that a diseased sinus can be present with no symptoms of which the patient is aware referable to the head.

We should also keep in mind that given a limited, inactive tuberculous lesion found on physical examination, we must not be misled to explain all the symptoms by this condition. Frequently an acute lesion at some other point is producing these symptoms. Nose and throat pathology are particularly common in those

whose resistance has been weakened by tuberculosis.

The pulmonary lesions secondary to chronic sinus infection may be characterized by localized areas of exudate in the lung. They give you the typical clinical picture of incipient tuberculosis. The X-ray may give us definite localized densities, but with two or more densities present they can be seen to be of the same quality. These pathologic changes do not follow the same course seen in tuberculosis, and so the X-ray shadows are different.

Pneumoconiosis.

In 1917, Dunham's first publications emphasized the fan as the characteristic lesion of tuberculosis, and his work was soon lauded as the key to the diagnosis of pulmonary tuberculosis. Jarvis, an oto-laryngologist in Barre, Vermont, began to X-ray chests of his patients, and found that most of the workers in the granite quarries of that vicinity showed fan-like densities which confused his interpretations. At his own expense he studied some three hundred cases, and found that stone-cutters' disease was a definite clinical entity. It was his observation that these densities which were present to a greater or lesser extent in all the chests of stone-cutters, resembled tuberculosis, post-influenzal conditions, lobar pneumonia, bronchopneumonia, carcinoma, sarcoma, lung abscess, pleurisy and so forth. All these are men who consider themselves well, and appear to be in perfect health, and are working every day. It was my privilege to study some two hundred of these films, and I must confess that, with what little I knew of pulmonary pathology at the time, it would have been impossible to differentiate these films from the actual conditions which were simulated. Only the occupational history gave the clue to the differentiation. This monumental work not only gave us a new concept of the many-sidedness of our problem, but also caused us to ask whether the early study of these cases would not direct us as to what type of lesions we might expect these densities to chart the highway for, when the patient's resistance fell too low, and emphasized the importance of the economic problem, for we may by this means be able to state which occupations produce a suitable preparation of the soil for the development of tuberculous and other processes. But primarily, it revealed the fact that the fan, in itself, was not the absolute characteristic of a tuberculous process.

Pulmonary Syphilis.

The question was recently asked me, "How do you make a diagnosis of pulmonary syphilis?" My answer was, "You don't make a diagnosis." We have seen numerous stereoscopic chest films, in which we felt that tuberculosis was not the etiologic factor for the densities seen. We observed four cases of pulmonary pathology, atypical for any of the well known infections, with a concomitant positive Wassermann. All of these were tentatively considered pathology of unknown etiology, possibly lues. One was observed after six months, no treatment, and the densities had disappeared; another was given intensive anti-luetic treatment, and after one year the density still remained; another cleared up under treatment, and later committed suicide, was autopsied, and no changes were observed in the tissues of the region in question; the fourth was not treated, and we lost track of him. Very gratifying results, indeed.

Two cases have come to us during the past year. In one of these we stated, "This is either far advanced tuberculosis or lues of the lung. If the former, he will not survive two months; if the latter, intensive anti-luetic treatment will produce changes which will assist in clearing up the diagnosis." This patient is comparatively well after one year, recently showed a positive Wassermann. We will never have opportunity to study this case at post-mortem, unless we break down his mausoleum.

The other case was diagnosed "tuberculosis complicated by other pathology, which may be lues." This man steadfastly denied luetic infection, but when a positive Wassermann was obtained, he admitted his infection. He also had a positive tuberculous sputum.

The spirochete has never been demonstrated in these pulmonary lesions, and until it is, we shall continue to lose sleep before we render a diagnosis of pulmonary lues.

Cardiac Changes.

Since it is very rare to find a patient with mitral stenosis contracting tuberculosis, it is still more strange that the X-ray differentiation between these diseases should be a difficult one. Cardiac pneumofibrosis of any type develops as part of a pathologic process which passes through the stages of active and passive congestion, edema, infarction, either minute or massive and fibrotic changes. As a result the extent of change varies widely from the X-ray viewpoint,

depending upon the severity and duration of the disease. As a rule, because it is a vascular process, the early changes are seen at the hilum and as the disease progresses they extend outward along the bronchial tree into the lung fields. They may even involve the entire lung area in advanced cases. Usually the films have a washed-out appearance, the density and size of the hilus shadow are increased, its borders are hazy and indefinite. But in old cases the outlines are distinct by virtue of the extensive fibrosis which has already taken place. These cases are frequently read as peribronchial or lymphatic tuberculosis. A careful study of the cardiac shadow is essential in these cases, and the radiologist should be acquainted with the clinical history and the physical findings.

Malignancy.

Malignant tumors, such as carcinoma or sarcoma of the lung, usually spread by continuity with nor regard for the septa, consequently they result in ball-like lesions in most cases. However, there is a type of carcinomatosis which follows the bronchial markings and then it must be ruled out by a thorough search for a primary malignancy.

I have not mentioned pulmonary gangrene, actinomycosis, echinococcus, spirochetal gangrene, and a few of the other rarer diseases because we can not describe typical findings for them.

Allow me to emphasize this fact again, that as long as the clinician does not give the Roentgenologist all the information he can possibly muster from his examination, we are greatly handicapped, and that only by constant post-mortem examination and pathologic work are we able to progress in our work. Personally, I shall consider it a favor to be allowed to study autopsies with any of you whether the chests in these cases be normal or otherwise.

TONSILECTOMY UNDER LOCAL ANAESTHESIA.

J. G. Patterson, M. D.,
Bartow, Fla.

I have found that operations, in all patients whose confidence can be reasonably well established, have proven very much more efficient and satisfactory, usually from ten years of age up, except in very nervous patients.

The course of procedure in tonsilectomy under local anæsthesia: Light supper the night before the operation, nothing taken into the stomach the morning of operation, 15 to 25 minutes before the operation, patient is given a hypodermic of 1/8 grain morphine and 1/250 grain scopolamin; five or ten minutes later, patient is placed in an ordinary treatment chair in a sitting or in a semi-recumbent posture.

The post-pharynx, tonsils, tonsil pillows and especially the posterior 1/3 of tongue are swabbed with a 10 per cent solution of cocaine until desensitized, care being taken to prevent patient from swallowing the cocaine solution. Each swab should be squeezed to remove excess of solution before applying. After five to seven minutes you should have complete relaxation of reflexes, which lessens pain and excitement from the later piercing by the needle.

The nervous gagging so often noticed may be quite well controlled by having patient breathe deeply through the open mouth.

The solution I use is a freshly prepared solution of novocaine, 1/2 of 1 per cent to 1 per cent, to which is added one drop of adrenalin chloride to the drachm. Any good tonsil syringe with curved tonsilar needle is sufficient. A needle is introduced behind the anterior pillows midway between the superior and the inferior poles, and a few drops injected. The needle is carried upward and downward without re-introducing, traction being made upon the needle to allow the solution to pass around the tonsil. The superior and inferior poles are treated in the same manner with special attention to the inferior, as it is usually more sensitive.

The posterior pillow is pierced in two or three places with just two or three drops at each point. The tonsil itself is injected with a few drops deep into the tissues, thus completing the anæsthesia of the first one, and the same procedure is immediately carried out for the second one, requiring two or three minutes to complete the injection and only about two or three drachms of the solution required for both tonsils.

Do not be too hasty in beginning operation, as most all pain is experienced at the beginning of the operation, showing that the solution has not had sufficient time to produce the complete anæsthesia.

Operation: Introduce a Lewis screw or lift the tonsil with tonsil forceps. Begin with Hurd's blunt dissector, or other instruments of your choice, and dissect from the tonsil the posterior pillow, beginning at the superior portion and dissecting downward, then carefully dissecting the

anterior pillow in the same manner, carrying it well to the base, then pass a wire loop, from a Beck or Beck-Shenk or Tyding's improved snare over the tonsil from above downward and slowly remove by pressure from the loop.

After removal, use retractor and see that no particles are left intact, also see that field of operation is free from bleeding points. If any points show bleeding, grasp with hæmostat and firm pressure is made, which usually controls the hemorrhage. If necessary, tie off the vessel; I have never had to tie one. I have used ice to the throat immediately after operation in persistent oozing. Usually ten minutes will control same very satisfactorily.

Do not stay in the wound too long. Do the work thoroughly and get out, thereby avoiding unnecessary traumatism to the parts.

I use as a routine a solution of glycerite of tanrin in the field of operation following the arresting of all visible hemorrhage, and in few cases, where oozing seemed persistent, I have resorted to the use of Monsel's solution. The objection to Monsel's solution, however, is the filthy discoloration and the coagulation of the blood.

I advise complete rest for 24 to 48 hours, ice bag for pain as long as the patient desires, which greatly lessens the danger of post-operative hemorrhage, and will practically control the pain.

I use as a routine a hypodermic of 1/8 morphine and 1/150 atropine every six or eight hours for three or four doses. That prevents the excessive flow of saliva and controls pain.

After the patients are up, I allow them to chew and swallow five grains of aspirin every three or four hours, if they require it for pain. It seems to act somewhat as a local anæsthetic, and is also slightly antiseptic.

I never us gargles, sprays or mouth washes, but have patient return to the office from time to time for inspection.

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THE SOUTHERN MEDICAL ASSOCIATION.

Florida has maintained a high percentage of membership in the Southern Medical Association, and it should be higher. Every member of the State Association should become a member of the Southern Medical. No organization wields a greater influence in medical matters in the South and its scientific attainments are nowhere exceeded. Its membership is composed of men of wide and varied experience in scientific research.

The co-operation and co-ordination of its membership is manifest and the cordiality and friendship expressed and displayed at its annual meetings is wholehearted, warm and sincere. The scientific program is replete with succinct and scintillating observations on the subjects presented in the papers read and the discussions are full and free, making the sessions a veritably intensive post-graduate study.

The Southern Medical Association issues a Journal which is mailed to each member monthly. The membership fee in the Association is $3,00 per year and every number of the Journal is worth that much to any one who will read it. The managers and editors are energetic, faithful and capable; men of earnestness and resourcefulness, and they would appreciate any scientific article sent them for publication and would consider it a favor to receive reports of interesting cases and contributions of constructive criticism relative to the quality of the Journal.

The Councilors in the various districts of the Florida Medical Association are working diligently to increase the membership, but the districts cover a large territory and one worker, however faithful, cannot do it all, and it behooves and ought to appeal to every member to do his "bit" in his immediate community, in offering every eligible member of the profession in the State an opportunity to become associated with his State medical organization and in no less degree, associate himself with the great Southern Medical Association. Everyone was urged to do his bit in order that the World War might be won, and it was done. Do your "bit" to increase the membership in the State Association so that when the next annual meeting is held at St. Petersburg in 1925 the enrollment will be 1,000 or more.

Prepare now to attend the meeting of the Southern Medical at New Orleans in November.

New Orleans offers much to the visitor. Its history is replete with romance and accomplishments. It is a beautiful city and characteristic. It is known the world over for its hospitality and as an outstanding medical center.

Please take notice of the "Application for Membership" blank for the Southern Medical Association which appears below. It is our sincere hope that every reader of this, who is not a member of the Southern Medical Association, will fill out the enclosed blank and mail it with a $3.00 check to the Southern Medical Association headquarters in Birmingham.

SOUTHERN MEDICAL ASSOCIATION

Application for Membership

....., 192.....

I desire to be enrolled as a member of the Southern Medical Association (which includes subscription to the Southern Medical Journal), for which I enclose $3.00 to pay the first year's dues. I am a member in good standing of the.....County and .....State Medical Societies.

Name.....
Local Address..... City.....

Are you a Railway Surgeon?..... State.....

MEMBERSHIP—The membership of this Association shall be limited to members of the various State and Local Medical Societies of the following States, viz: Alabama, Arkansas, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia, and Medical Officers of the United States Army, Navy and Public Health Service.—Art. III, Sec. 1, Constitution.

DUES—The dues of this Association (which includes a year's subscription to the Southern Medical Journal) shall be $3.00 per year, payable annually.—Extract, Chapter VIII, By-Laws.

Fill out and mail with check to Southern Medical Association, Empire Bldg., Birmingham, Ala.

THE DEVELOPMENT OF ORGANIZED MEDICINE IN FLORIDA

During our last annual meeting in Orlando, considerable enthusiasm was developed relative to increasing the membership of our Association. Our President presented to us in his address some most interesting facts showing the lethargy in the upbuilding of our organization. To quote from this address published in the June, 1924, issue of THE JOURNAL:

"Chart showing (1) number of physicians in these States as per 1923 A. M. A. Directory; (2) number who are members of the State Medical Associations; (3) per cent who are members of State Associations.

STATE.	No. Doctors 1923 A. M. A. Dir. (1)	In State Med. Assn. 1923 A. M. A. Dir. (2)	Per Cent Mem. State Assn. (3)
Virginia	2,503	1,959	78%
West Virginia	1,751	1,447	83%
Alabama	2,213	1,665	72%
North Carolina	2,226	1,551	70%
Missouri	5,827	3,555	61%
Oklahoma	2,600	1,567	61%
Kentucky	3,155	1,858	59%
Texas	6,094	3,516	58%
Georgia	3,274	1,860	57%
Louisiana	2,058	1,121	55%
Maryland	2,349	1,264	54%
South Carolina	1,368	729	53%
Arkansas	2,303	1,194	52%
Mississippi	1,792	848	48%
Tennessee	3,228	1,440	45%
Florida	1,348	586	44%
	44,189	26,160	Av. 59%

I must admit on perusal of same that I was shocked to find that there was no State south of the Mason and Dixon Line which had so small a percentage of the physicians residing within its borders in their State Association as has Florida. When we have heard from all sides the reports from the statisticians of the tremendous development of Florida in the past few years and then see this small increase in our membership, it is full time for us to ask ourselves why this is true. First, let us inquire as to what has become of the 335 men who were licensed by our examining boards from 1918 to 1923 to practice medicine in Florida. Surely, an overwhelming percentage of these men are ethical and eligible and are splendid timber for our organization.

The Florida Medical Association Statistics, as printed in the Directory of the American Medical Association for the years 1918 and 1923:

	Population of Florida	Membership of Fla. Medical Assn.
1918	870,802	568
1923	968,470	586

Can it be that with the phenomenal development of our great State we are going to set idly by and not develop organized medicine? We of the medical profession revel in the thought of what organized medicine has accomplished in the State and feel its growth and development was made possible by medical science administered by organized medicine.

In some sections activity in developing and increasing membership in the county societies has been noted. Sarasota County has recently organized because some one individual was interested enough in organized medicine to spend a few hours in interesting others.

Quoting again from the President's address in Orlando:

"Technically speaking, there has been no provision in our Association for a Councillor for the following counties: Okaloosa, Dixie, Seminole, Union, Flagler, Bay, Highlands, Glades, Hardee, Charlotte, Hendry, Collier, Broward, Okeechobee and Sarasota. In this matter our Association has been in a deep sleep that rivals that of Rip Van Winkle and it is now time for us to open our eyes and see where we are. West Virginia 83 per cent, Virginia 78 per cent, Alabama 72 per cent, and Florida, last and least, 44 per cent—the smallest percentage of any Southern State.

In our Association, the precedent has been handed down that a Councillor was more or less an inactive officer and that little was expected of him, and yet, in a recent bulletin of the American Medical Association, the statement was made that the Councillor was the most important officer of the State Association.

With the reapportionment of Districts, and the appointing of new Councillors, it is hoped that they will evidence a keen interest in organizing societies and stimulating all eligible men in their districts to become members.

Our association must increase its membership proportionately with the growth of the State, in order that organized medicine may protect the public. Legislation which concerns public health matters is constantly being brought before our legislative bodies and our fair-thinking legislators are looking to organized medicine for advice. If we permit a lagging in our growth, we cannot expect to exert the good and necessary influence that organized medicine is exerting in our adjoining States. In 1923 organized medicine constituted the minority of practitioners in this State.

Charlatans and poorly qualified practitioners from without our borders through numerous avenues, have attempted in the past to have legislation passed that will permit them to practice without appearing before our State Board of Medical Examiners. Quoting an editorial appearing in the August, 1923, issue of THE JOURNAL:

"Florida cannot now and never will be able to countenance license by reciprocity. The leaders of our profession throughout the State are a unit on the question. THE JOURNAL believes, however, that we should clearly show our sister States that our stand is taken in the interests of the general public rather than from selfish motives. The whole trend of medical legislation throughout the entire country for the past decade and longer has been to demand of those who wish to follow the practice of medicine as a life career, educational qualifications that would justify the granting of license by the State body. In only this manner can the State protect the public from the charlatan, the quack and men of mediocre or no ability."

This bill will undoubtedly be brought up before our next Legislature along with numerous other measures which concern the public health of every community. Will organized medicine be ready to serve our public as matters of this nature arise?

Annually a large number of physicians are obtaining license in the State. From our membership statistics these men are certainly not becoming members of the County and State Societies in the proportion that they should. Undoubtedly the majority of these men are desirable and eligible, but do not evince interest in organized medicine, because of our failing to bring them into our fold. We must consider carefully all applicants and prevent those who would exert malign influence on our activities from obtaining membership, but there must be hundreds of practitioners in the State who are eligible and who are not within our ranks.

Let this editorial serve as an impetus to the *thousand member campaign* begun at our last meeting. Let each man feel his individual responsibility to organized medicine and the public health of this sun-blest land of ours.

THE SARASOTA MEDICAL SOCIETY

THE JOURNAL is glad to announce that since our last issue the Sarasota County Medical Society has been organized.

The charter members of the Sarasota County Medical Society have long been an inspiration to the medical men of Florida, and the State Association now extends through THE JOURNAL their heartiest congratulations and wish them godspeed.

This new organization in its first week announces the fact that every member holds membership in the Southern Medical Association. Some of our older societies in the State would do well to follow such an example, for this is

but another evidence of progress and good judgment.

The development of Sarasota in finance and commerce has astounded Florida, and we can all rest assured that in things medical the Sarasota County Medical Society will now do likewise. It is to be hoped that other counties in the State who have not organized will take notice of this and resolve to follow this example immediately.

The present officers are as follows:

Dr. Joseph Halton, President.

Dr. Jack Halton, Vice-President.

Dr. O. H. Cribbin, Secretary and Treasurer.

Sarasota County Medical Society—good luck and God bless you.

PINELLAS COUNTY MEDICAL SOCIETY

At a recent meeting of the Pinellas County Medical Society the following officers were elected for the ensuing year:

President, Carl A. Williams.

First Vice-President, LeRoy A. Wylie.

Second Vice-President, H. L. Putnam.

Treasurer, A. J. Smith.

Secretary, O. O. Feaster.

Censor, '27, A. J. Wood, *vice* A. J. Wood.

REVIEWS FROM CURRENT LITERATURE

BRONCHIAL ASTHMA.

Bronchial Asthma Treated with X-Rays. The British Journal of Radiology, Vol. XXIX, No. 289, August, 1924, p. 307.

Schilling and Grodel, in "Die Roentgen Behandlung Innerer Krankheiten," independently found somewhat accidentally that a patient treated for another condition who had suffered severely with asthma was relieved of the asthma. Grodel, during 1920 and 1921, treated the spleen of 71 patients suffering with asthma and seventy-five per cent of the patients were markedly improved and relieved.

INFECTIONS OF THE HAND

Garlock, John H.: Infections of the Hand. Surg. Gyn. & Obc., Vol. XXXIX, p. 165.

The following paper embodies an analysis and a report of the end-results of 460 consecutive infections of the hand seen in the private, clinic, and hospital practice of the writer:

1. The vast majority of simple abscesses of the hand are, as a rule, easily recognized and may be treated adequately. The occasional case of abscess over the site of a clearly defined anatomical synovial compartment or fascial space often offers considerable difficulty in differential diagnosis. Recognition of the importance of minor signs would seem to tend to overcome this difficulty.

2. Localized cellulitis of the digits and hand often simulates closely the more severe infections of the tendon sheaths or fascial spaces. As conservative treatment practically always results in a cure and as unnecessary incisions usually aggravate the conditions present, it becomes imperative to study most carefully the various symptoms and objective findings in each individual case so that a positive diagnosis may be arrived at.

3. Isolated abscess of the web spaces is not an infrequent form of hand infection. The physical signs are distinctive and, to secure adequate drainage, the web may be split from the front to back, for no untoward sequellæ followed this procedure.

4. The successful treatment of collar-button abscess depends mainly upon the recognition and isolation of the tiny sinus connecting the superficial and deep pockets. The latter is very often the more extensive of the two. The results in this group are most satisfactory, two out of the 42 in this series presenting slight permanent anatomical defects.

5. Paronychia is probably more often unilateral than total. It is better apparently to treat these early infections radically than to await the more evident typical "run-around." It is more important to remember that, in the majority of instances (28 out of 42 cases here) the subungual region adjacent to the infected paronychium is also involved, requiring removal of the side and corner of the nail to secure proper drainage. The chronic cases, with fungus-like granulations extending from beneath the eponychium, yield to the radical operation or a Bier's hyperæmia for a short while.

6. Carbuncles are found on the dorsum of the hands and fingers, the pathology depending upon the anatomical peculiarities of the skin in this region. The successful treatment of this form of infection calls for the early recognition of

the extent of pathology present and wide radial incisions with undermining of the skin flaps.

7. Felons may be either localized, involving only a part of the anterior closed space, or they may affect the entire space. The proportion in this series was 25 to 37 cases. Diagnosis usually offers very little difficulty. In the treatment, the important factors are the time for incising anatomical position of the incision. It would appear that the side incision offers the best chance for a symptomatic cure. Where a discharge continues after satisfactory drainage, the cause is usually to be found in an osteomyelitis of some part or whole of the distal phalanx. Twenty-one of a total of 62 presented this complication. Depending upon the extent of involvement, recovery results with conservatism in the mild cases and removal of the necrosed portion in the more extensive ones. With the epiphysis untouched, regeneration of at least part of the diaphysis occurs more often than realized. The reconstruction of deformed tender scars constitutes another phase of the later treatment.

8. Chronic localized superficial infections of the hand are not uncommon. While the staphylococcus aureus is the most frequently cultured organism, the cause for the failure of the heal is to be found locally and is, as a rule, thermal, mechanical, or chemical. Removal of the cause will, in the majority of cases, bring about a speedy recovery.

9. Suppurative renosynovitis of the flexor tendon sheaths should be considered a major surgical condition. In its successful treatment the ingenuity and patience of the surgeon are frequently taxed to the utmost. When the subject is carefully analyzed, it appears that, until our knowledge of the anatomy, physiology, and pathology of the tendons and their sheaths is more perfect, the best end-results can be obtained by (a) an early diagnosis made possible by proper evaluation of physical signs; (b) early operation, preferably during the first twenty-four hours; (c) performing the operation in a bloodless field with the patient under general anæsthesia; (d) the use of properly placed and sufficiently long primary incisions; (e) making every attempt to avoid secondary contamination and infection during the post-operative period; (f) reducing the use of drainage material to a minimum; (g) the early employment of active and passive motion and, later, of other physio-therapeutic remedies and devices; and (h) maintaining an attitude of constant close attention to details until treatment has been terminated.

The possibility of extension to the various bursæ and fascial spaces must be borne in mind and, when involved, they also are treated along the same lines. The immediate and late results of tenosyvonitis, in the last analysis, depends upon the ultimate fate of the involved tendons. Of 42 cases here reported, 30 sloughed some part or the whole length of one or both tendons, a percentage of 71.4 Accepting the principles of treatment as outlined, results can be improved by early diagnosis and operation.

10. Suppurative ulnar bursitis follows either a tenosynovitis of the little finger or an extension from the radial bursa, the latter occurring in 33.3 per cent of the cases in this series. Diagnosis is not difficult when the history and previous pathology are known and when the various objective findings are carefully evaluated. The treatment calls for properly placed adequate incisions both in the hand and above the wrist and the application of the same principle outlined under suppurative tenosynovitis. To secure free drainage in particularly virulent cases, the anteroannular ligament may be split. No untoward results followed this procedure. When the infection extends beyond this sac, in the hand the middle palmar space or the radial bursa or both become infected, and in the forearm the deep spaces become involved. Great difficulty is experienced in attempting to analyze end-results because of their direct bearing on the outcome of the infection in associated anatomical regions.

11. The observations recorded above apply equally as well to suppurative radial bursitis. Radial bursitis frequently follows traumatic amputations of the thumb. In making the incision, every effort should be made to avoid injuring the intrinsic muscles of the thumb so that the important apposing action may be preserved. It is rarely, if ever, necessary to split the annular ligament, for the upper end of the bursa can be thoroughly drained through the external lateral incision above the wrist. The end-results depend mainly on the outcome of the associated infections.

12. Thenar space infection is a most characteristic entity. The predominant diagnostic feature is the excessive ballooning out of the thenar eminence. Accepting the anatomical outline and

limits of this space, treatment consists mainly in making the incision advocated by Kanavel. A complete restoration of function can be expected in every uncomplicated case.

13. The diagnosis of infections of the midpalmar space should rarely offer any great difficulty. The outstanding single objective finding is the replacement of the normal concavity of the palm by a convexity. Bearing in mind the anatomical boundaries and position of this space, the reason for using the incision recommended becomes apparent. In the great majority of uncomplicated cases there is every reason to expect an excellent end-result—80 per cent in this series. In other cases, the final outcome appears to be influenced by infections in adjacent tendon sheaths and bursæ.

14. The important facts determined by an analysis of the deep forearm abscesses were (a) that they were caused by extension from a preexisting radial or ulnar bursa infection; (b) that the pus was situated deep to the flexor tendons; (c) that satisfactory drainage could be obtained only by the side incisions; and (d) that the final results were generally satisfactory.

15. Suppurative tenosynovitis of the common extensor tendon sheath is an uncommon condition. While not pathognomonic, the outstanding signs and symptoms are inability to flex the fingers and the absence of positive findings on the anterior aspect of the hand. Simple splitting of the sheath seems to form the basis of treatment. It is interesting to note that necrosis of the extensor tendons occurs rarely. The number of good late results is thereby greatly increased.

16. Osteomyelitis of the proximal or middle phalanges usually follows incompletely drained flexor tenosynovitis. The proximal interphalangeal joint is very often involved. The course of treatment followed will depend upon the extent of the disease, various cosmetic and economic factors and the progress of associated infections and will range from simple conservatism to amputation.

17. Infection of the palmar fascia is a rare condition, evidencing definite pathological findings and caused usually by the staphylococcus aureus. Treatment is simple and consists of incision with removal of the necrosed fascia. The results are good.

18. Phlegmonous lymphangitis is a severe lymphatic infection on the dorsum of the hand, forearm and often on the arm, accompanied by necrosis of the subcutaneous tissues, superficial fascia and, sometimes, large areas of skin. Marked systemic symptoms manifest themselves and are often severe enough to overwhelm the patient. Adequate drainage through multiple incisions, maintenance of the fluid level of the body, the use of the Carrel-Dakin technique and transfusions are the main factors in treatment.

19. The intelligent treatment of hand infections demands a knowledge of the anatomy of the hand and the various pathological processes that may exist. Every effort should be made to obtain the best result possible, for the hand, from the economic, social and cosmetic standpoints, is one of the most important organs of the human body.

PITUITARY AND THYROID GLANDS.

The Treatment of Climacteric Symptoms by X-Irradiation of the Pituitary and Thyroid Glands, the British Journal of Radiology, Vol. XXIX, No. 289, August, 1924, p. 293. Translation by Dr. J. Borak, Central Radiological Institute of the General Hospital in Vienna.

The symptoms that develop after the removal or the cessation of the function of the ovaries are apparently due to a disturbance of internal secretion. X-ray treatment of the region of the sella and also of the thyroid region relieves these symptoms. It is also definite that X-ray treatment of the thyroid and sella reduces their secretions and it suggests that a hyperactivity of these glands is the cause of the symptoms of the climacteric. Results of this method of treatment have been good.

ROENTGEN RAY TREATMENT.

The Roentgen Ray in the Treatment of Giant Cell Tumors, by R. E. Herendeen, M. D., N. Y. City, Amer. Jour. of Roentgenology and Radium Therapy, Vol. XII, No. 2, August, 1924, p. 117.

Amputation has been done often for this condition and unnecessarily. Surgery implies thorough curretement of the lesion. Roentgen treatment offers much indeed. Cases were studied and treated at the Memorial Hospital, N. Y. City. He summarizes as follows:

1. The appearance of the giant-cell tumor in the roentgenogram can usually be relied upon to establish a diagnosis.

2. Treatment by radiation obviates, in many cases, the loss of the limb by amputation.

3. Treatment by radiation can be relied upon to produce growth-restraint, firm encapsulation

of the tumor, and relief of pain in the majority of the cases.

4. A more rapid ossification is brought about, with a more rapid restoration of function, than when some surgical procedure is the method of treatment.

5. Treatment by radiation is followed by a reaction evidenced clinically and roentgenologically, simulating rapid growth of the tumor. Pain and tenderness diminish as the reaction subsides, ossification takes place and function returns.

LESIONS OF THE COLON.

Diverticulosis and Diverticulitis of the Colon, by Chas. D. Enfield, M. D., F. A. C. P., Louisville, Ky., Amer. Jour. of Roentgenology and Radium Therapy, Vol. XII, No. 3, Sept., 1924, p. 242.

This lesion is a relatively common one but quite frequently overlooked, as at the finish of a barium meal gastro-intestinal study is often skimped, especially the study of the colon with the enema. The colon needs to be observed day after day with the meal and also before and after the enema. Retention in the diverticula of barium is often best seen after the barium enema has been expelled and for several days thereafter. Commonest location is the sigmoid, although the entire colon may be involved. Give rise to indefinite acute attacks generally mistaken for gallstones. May develop an abscess or acute obstruction. Confusion with malignancy is common. Occur in all portions of the gastro-intestinal tract but most common on the colon.

PUBLISHER'S NOTE

A MATTER OF CRITICAL IMPORTANCE

A point worthy of serious consideration has been brought out in recent discussions of the obstetric dose of pituitary extract. It is that unless the extract itself is of uniform activity, one make being assayed by the same standard as another, there can be no fixed dosage, not even a safe dosage, of the product as supplied by different manufacturers. The point is sustained by tests which show that some specimens on the market are three or four times as active as others. It would seem, therefore, desirable, in the interests of safety and efficiency, for the physician to do one of two things: Either adopt one make of pituitary extract and stick to it—Pituitrin, for example—or, ordering in original packages, be guided by the dosage recommended by the manufacturer, whoever he may be. The advantage of the former method is obvious: The physician has one pituitary product for all occasions, one that he can rely upon as a result of his acquaintance with it and with other products of the same house.

It is hardly possible to translate the dose of one pituitary extract into that of another, the different standards being unknown; the physician must, in practice, depend upon the manufacturer and his own experience. A pituitary extract can be dangerously active as well as hopelessly inactive; the *sine qua non* is a combination of activity with relative safety, and above all *uniformity*.

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